461

GUIDE TO THE LITERATURE ON COLLAGEN

Rubin Borasky

CONTENTS

PAGE

Introduction i

Acknowledgements ii

Sources Consulted. ii

Note on the classification of references iii

Citations --

Section I. Biology 1

A. Histogenesis, Tissue Culture, Wound Healing. 1

B. Histology and Histological Technique 5

C. Physiology and Pathology 11

D. Connective tissue, Elastin and Reticulin 16

Section II. Biophysics 21

Section III. Chemistry 29

A. Sources and determination. 29

B. Preparation and general chemical properties. 32

C. Amino acid composition and determination 36

D. Reactions with acids, alkalies and salts 39

E. Reactions with enzymes 45

F. Reactions with tanning agents. 51

G. Physical chemistry and physics 56

H. Leather, Technology, Industrial applications and Products. . 67

I. Patents. 74

J. Gelatin. 76

K. Elastin and Reticulin. 82

L. Proteins and topics related to collagen study. 83

Section IV. Supplementary list of references (1947 to September 1949) 92

Author Index 103

Subject Index. 119

GUIDE TO THE LITERATURE ON COLLAGEN

Rubin Borasky

INTRODUCTION

The term collagen refers to a chemical substance of animal origin. Biologically, collagen is recognized by its preferential staining reactions. The biophysicist recognizes collagen by its x-ray diffraction pattern, and appearance in the electron microscope. Collagen is a natural fibrous high polymer possessing little elasticity but great mechanical strength.

To the chemist, collagen is a simple albuminoid protein, which is, at ordinary temperatures insoluble in water, dilute acids and alkalies, and solutions of salts such as sodium chloride and ammonium sulfate. In its native state collagen is resistant to digestion by certain proteolytic enzymes. Collagen has physico-chemical properties which set it apart from other proteins. These are its characteristic iso-electric point, the property of birefringence, and swelling reactions in acids, alkalis and solutions of certain salts such as barium chloride and calcium chloride. When heated gradually in water, collagen shrinks within a small but well-defined temperature range.

When boiled in water for a sufficiently long time, collagen is irreversibly changed into gelatin, a water soluble protein, having many physical and chemical properties (other than solubility in water) markedly different from its forerunner collagen. Much of our knowledge of the chemistry of collagen, in particular, and proteins in general, has been derived from investigations on gelatin.

Bracconot's discovery of glycine in a gelatin hydrolysate (1820) [749], and Graham's [789] investigations on the diffusion of gelatin solutions (1861-1865) mark the beginning of protein and colloid chemistry, respectively.

A greatly enriched knowledge and understanding of the gross and microscopic anatomy of animal tissues and organs is the result of many studies made on collagenous tissues by investigators since Malphigi founded the science of histology. [illegible] not surprising since collagen is so widely distributed throughout the animal kingdom, and is found in varying amounts in all vertebrate animal tissues and organs.

The leather technologist is concerned with the chemical, mechanical and physical properties of collagen, so that he can modify and control the many processing steps involved in leather manufacture to improve processing efficiency and obtain desired qualities in the finished leather.

This bibliography was started as an aid in planning and executing experiments, to elucidate the fundamental physical and chemical properties of collagen, so essential for a better understanding of the tanning mechanism, and improvement of tanning practice. The large number of references obtained, and the varied fields of scientific investigation covered by these references, suggested that a bibliography on collagen would be of value to many workers in biological, biophysical, chemical and physical research

Limiting the references to collagen alone was found to be impossible since the terms gelatin, glue, skin, hide substance, hide powder, connective tissue, tendon and others are very frequently though erroneously used as synonyms for collagen. This is a fortuitous circumstance, since much of our knowledge concerning collagen is based on investigations of the various collagenic derivatives or tissues listed. The strictly non-collagen references have been kept to a minimum as a necessity but it is hoped there are enough such citations to be of use to investigators whether their interests are biological, chemical or technological.

ACKNOWLEDGEMENTS

Grateful acknowledgement is made of the helpful cooperation received from Miss Miriam W. Huddle, Librarian of the Wyndmoor Branch, U. S. D. A. Library without whose aid this bibliography could not have been compiled. The author is grateful to Dr. J. H. Highberger of the United Shoe Machinery Company, for the use of his card file of references on collagen. The author is also indebted to the many colleagues at the Eastern Regional Research Laboratory who brought collagen references to the author's attention, aided in the translation of titles in foreign languages, and for their encouragement during the preparation of this bibliography.

SOURCES CONSULTED

Chemisches Zentralblatt	1830-1939
Chemical Society London Journal Abstracts	1878-1925
Index Medicus	1879-1926
Surgeon General's Catalog	Ser. 1-4; 1880-1938
Society Chem. Ind. Journal	1882-1925
U S. Office of Experiment Stations, Experiment Station Record	1889-1944
U. S. Dept. of Agriculture Index to Publications	1901-1940
American Leather Chemists Assoc. Journal	1906-1946
Chemical Abstracts	1907-1946
Agricultural Index	1916-1946
Quarterly Cumulative Index Medicus	1916-1946
Industrial Arts Index	1920-1946
British Chemical Abstracts	1926-1945
Biological Abstracts	1927-1944
Bowes, J. H. and Kenten, R. H.	1900-1946

1947. Summary of published results on Amino acid composition of gelatin and collagen. British Leather Manufacture Research Association Laboratory Reports, 26: 1.

Card file of references
J. H. Highberger - United Shoe Machinery Company

NOTE ON THE CLASSIFICATION OF REFERENCES

References in this bibliography are grouped into four sections. Section I, Biology references, is classified under four headings, and Section III, chemistry references, are classified under twelve headings. Section IV is a supplementary list of references which were obtained from a search of Chemical Abstracts, Biological Abstracts, the Journal of the American Leather Chemists Association, the Journal of the International Society of Leather Trades Chemists, published from January 1947 through August 1949. The citations are arranged alphabetically and chronologically according to author within each classification group. More detailed classification of the references will be found in the subject index, which was made as comprehensive as possible so as to make the bibliography independent of the classification system adopted as a matter of convenience to the author. Each citation was verified by consulting the original source whenever possible. Chemisches Zentralblatt, Chemical Abstracts, Biological Abstracts, and other secondary sources were consulted only when the original source was not available in the libraries of the Philadelphia area. Insofar as possible abbreviations used are those in the United States Department of Agriculture Miscellaneous Publication 334, "Abbreviations used in the Department of Agriculture for Titles and Publications".

(14) GRYNFELTT, E.
1930. HISTOGENESIS OF COLLAGENIC FRAMEWORK IN CICATRICIAL TISSUE OF LOOSE CONNECTIVUM IN COURSE OF SUBCUTANEOUS EXPERIMENTAL SUPPURATIONS. Ann. d'anat. Path. 7: 969-974.

(15) HASS, G.
1940. STUDIES OF COLLAGEN; METHODS AND RESULTS OF IMPLANTATION OF COLLAGEN-FORMING CULTURES IN GRANULATION TISSUE. Amer Jour. Path. 16: 549-560.

(16) ------- and MCDONALD, F.
1940. COLLAGEN. I. PRODUCTION OF COLLAGEN IN VITRO UNDER VARIABLE EXPERIMENTAL CONDITIONS. Amer Jour. Path. 16: 525-548. C.A. 35: 2200.

(17) HERINGA, G. C., and LOHR, H. A.
1925. COLLAGENOUS FIBRILS, THEIR ORIGIN, STRUCTURE AND ARRANGEMENT. K. Akad. van Wetensch. te Amsterdam. Verhandel. 28: 509-517. C.A. 20: 425.

(18) --------
1926. ON THE NATURE AND GENESIS OF COLLAGEN FIBERS. Bul. d'Histol. Appl. a'la Physiol. 3: 125-141; 201-211.

(19) HUZELLA, T. and LENGYEL, J.
1932. ORIENTATION OF GROWTH OF TISSUE CULTURE ON ARTIFICIAL FIBRILLARY FRAMEWORK OF COAGULATED COLLAGEN. Soc. De Biol. Paris Compt. Rend. 109: 518-518.

(20) KNAKE, E.
1939. FORMATION OF COLLAGEN FIBERS IN CULTURES OF CONNECTIVE TISSUES. Arch. f. Exper. Zellforsch. 22: 492-495.

(21) LEVI, G. M.
1930. CHARACTERISTICS OF TENABLASTS AND BEHAVIOR OF COLLAGEN FIBERS IN CULTURES OF TENDON OF EMBRYOS OF FOWLS. Soc. Ital. di Biol. Sper. Bol. 5: 321-324.

(22) LEVI-MONTALCINI, R. and SACERDOTE, E.
1938. CHARACTERISTICS AND MODALITY OF DEVELOPMENT OF COLLAGEN AND RETICULAR FIBERS CULTERED IN VITRO. Arch. Ital. di Anat. e di Embriol. 40: 37-121.

(23) LEWIS, M. R.
1917. THE DEVELOPMENT OF CONNECTIVE-TISSUE FIBERS IN TISSUE CULTURES OF CHICK EMBRYOS. Carneg. Inst. Contrib. to Embryol. 6:45-60.

(24) LEWIS, W. H. and LEWIS, M. R.
1917. THE DURATION OF THE VARIOUS PHASES OF MITOSIS IN THE MESENCHYME CELLS OF TISSUE CULTURES. Anat. Rec. 13: 359-367.

(25) LUCIEN, M.
1933. COLLAGEN METAMORPHOSIS OF FIBERS OF STRIATE MUSCLES. Soc. de Biol. Paris Compt. Rend. 112: 1981-1982.

SECTION I. BIOLOGY

A. HISTOGENESIS, TISSUE CULTURE, WOUND HEALING

(1) ABELL, R. G. and CLARK, E. R.
1932. A METHOD OF STUDYING THE EFFECT OF CHEMICALS UPON LIVING CELLS AND TISSUES IN THE MOAT CHAMBER, A TRANSPARENT CHAMBER INSERTED IN THE RABBITS EAR. Anat. Rec. 53: 121-140 B.A. 7: 15585.

(2) ALFEJEW, S.
1926. HISTOGENESIS OF COLLAGENOUS AND RETICULAR FIBERS IN MAMMALS. Ztschr. f. Zellforsch. u. Mikros. Anat. 3: 149-168 B.A. 1: 13653.

(3) BAITSELL, G. A.
1916. THE ORIGIN AND STRUCTURE OF A FIBROUS TISSUE FOUND IN WOUND HEALING. Jour. Expt. Med. 23: 739-756.

(4) BENTLEY, F. H.
1936. WOUND HEALING IN VITRO. Jour. Anat. 70: 498-506. B.A. 11: 2014.

(5) BOURNE, G.
1942. VITAMIN C AND REPAIR OF INJURED TISSUES. Lancet II: 661-664 C.A. 37: 3136.

(6) CARREL, A. and EBELING, A. H.
1926. FUNDAMENTAL PROPERTIES OF THE FIBROBLAST AND MACROPHAGE; FIBROBLAST. Jour. Expt. Med. 44: 261-284.

(7) CHLOPIN, N. G.
1932. STUDIES ON TISSUE CULTURES IN DIFFERENT SPECIES OF BLOOD PLASMA. V. THE BEHAVIOR AND TRANSFORMATION OF HUMAN MESENCHYME IN EXPLANTATES. Arch. Expt. Zellforsch. 12: 11-85.

(8) CLARK, E. R.
1912. FURTHER OBSERVATIONS ON LIVING GROWING LYMPHATICS; THEIR RELATION TO THE MESENCHYME CELLS. Amer. Jour. Anat. 13: 351-379.

(9) ----------, KIRBY-SMITH, H. T., REX, R. O., and WILLIAMS, R. G.
1930. RECENT MODIFICATIONS IN THE METHOD OF STUDYING LIVING CELLS AND TISSUES IN TRANSPARENT CHAMBERS INSERTED IN THE RABBITS EAR. Anat. Rec. 47: 187-211.

(10) DANN, L., GLÜCKSMANN, A. and TANSLEY, K.
1942. EXPERIMENTAL WOUNDS TREATED WITH COD-LIVER OIL AND RELATED SUBSTANCES. Lancet I: 95-98. C.A. 36: 3852.

(11) DÜGGELI, O.
1937. THE SHAPING INFLUENCE OF TENSILE STRESS ON CONNECTIVE TISSUE CULTURES. Ztschr. f. Zellforsch. u. Mikros. Anat. 26: 351-380.

(12) GAZA, W. von
1918. CHANGES OF CONDITION IN TISSUE COLLOIDS ASSOCIATED WITH THE HEALING OF WOUNDS. Kolloid. Ztschr. 23: 1-11. C.A. 13: 1339.

(13) GHIRON, V.
1927. INSOLUBLE COLLAGEN, NEW MATERIAL FOR CLOSING WOUNDS. Arch. ital. di Chir. 17: 337-360.

(37) OLIVO, O. M.
1930. DIFFERENTIATION OF COLLAGEN FIBERS IN VITRO. Soc. Ital. di Biol. Sper. Bol. 5:109-111. B.A. 5: 29250.

(38) --------
1933. GENESIS OF COLLAGEN FIBRILS IN CULTURES IN VITRO. Monit, Zool. Ital. 44: suppl. 50-59.

(39) PARKER, R. C.
1932. RACES THAT CONSTITUTE THE GROUP OF COMMON FIBROBLASTS: EFFECT OF BLOOD SERUM. Jour. Exp. Med. 55: 713-734.

(40) --------
1933. RACES THAT CONSTITUTE GROUP OF COMMON FIBROBLASTS: EFFECT OF BLOOD SERUM. Jour. Expt. Med. 58: 97-113.

(41) PFEIFFER, H. H.
1943. MEASUREMENTS WITH THE POLARIZING MICROSCOPE OF COLLAGEN FIBRILS IN VITRO. Arch f. Expt. Zellforsch. 25: 92-100. C.Z. 1944 I: 97-98. C.A 39: 3314.

(42) PISCHINGER, A.
1932. ON THE FORMATION OF THE 4TH AND 5TH PHARYNGEAL POUCH OF THE WHITE RAT. Ztschr. f. das Gesam. Anat. Abt. I. Ztschr. Anat. u. Entwicklungages. 99: 113-116. B.A. 8: 9644.

(43) QUEIDO, A. and GAILLARD, P. J.
1939. INFLUENCE OF VITAMIN C ON THE FORMATION OF COLLAGEN BY OSTEOGENETIC EXPLANTS IN TISSUE CULTURE. Acta Brevia Neerland. Physiol. Pharmacol. Microbiol. 9: 70-72. C.A. 33: 4637.

(44) ROZYNEK, M.
1939. FORMATION OF COLLAGEN FIBRILS IN JENSEN SARCOMA IN VITRO. Arch. f. Expt. Zellforsch. 21: 391-394.

(45) RUMJANTZEW, A. W. and SUNTZOWA, W. W.
1935. INVESTIGATIONS ON THE ORIGIN AND DIFFERENTIATION OF FIBRILLAR STRUCTURES IN MEZENCHYMAL TISSUES IN VITRO. Arch. F. expt. Zellforsch. 17: 360-411. B.A. 10: 22254.

(46) SACERDOTE de LUSTIG, E.
1944. CHANGES OF ACTIVITY AND GROWTH OF CONNECTIVE TISSUE CULTIVATED IN VITRO IN A MEDIUM WITH VITAMIN C. Rev. Soc. Argent. de Biol. 20: 170-178. C.A. 39: 353.

(47) SANDISON, J. C.
1924. A NEW METHOD FOR THE MICROSCOPIC STUDY OF LIVING, GROWING TISSUES BY THE INTRODUCTION OF A TRANSPARENT CHAMBER IN THE RABBIT'S EAR. Anat. rec. 28: 281-287.

(26) MAXIMOW, A. A.
1928. THE DEVELOPMENT OF ARGYROPHILE AND COLLAGENOUS FIBERS IN TISSUE CULTURES. Soc. Expt. Biol. and Med. Proc. 25: 479-[illegible].

(27) --------
1928. FORMATION OF ARGYROPHILLIC AND COLLAGENIC FIBERS IN CONNECTIVE TISSUE AND LEUKOCYTE CULTURES. Centbl. f. allg. Path. u. Anat. 43: 148-172.

(28) --------
1929. ON THE DEVELOPMENT OF ARGYROPHILLIC AND COLLAGENIC FIBERS IN CULTURES OF FULLY GROWN MAMMALS. Ztschr. f. Mikros.-Anat. Forsch. 17: 625-659.

(29) MAZOUE, H.
1937. ACTION OF ASCORBIC ACID ON THE FORMATION OF CONNECTIVE TISSUE FIBERS. Soc. de Biol. Paris Compt. Rend. 126: 991-992. C.A. 32: 2587.

(30) MCKINNEY, R. L.
1929. STUDIES ON FIBERS IN TISSUE CULTURE. III. THE DEVELOPMENT OF RETICULUM INTO COLLAGENOUS FIBERS IN CULTURES OF ADULT RABBIT LYMPH NODES. Amer. f. Exp. Zellforsch. 9: 14-35. B.A. 7: 1909.

(31) MOLLENDORFF, W. von.
1932. MOTHER SUBSTANCE OF CONNECTIVE TISSUE CULTURES. Ztschr. f. Zellforsch. 16: 171-186.

(32) NAGEOTTE, J.
1916. GENESIS AND EVOLUTION OF CONNECTIVE TISSUE SUBSTANCES IN CERTAIN MAMMARY TUMORS. Soc. de Biol. Paris Compt. Rend 79: 940-946. C.A. 11: 1496

(33) --------
1926 REUNION OF CUT COLLAGENOUS FIBERS, STUDIED BY GRAFTS OF LIVING AND DEAD TENDONS. Soc. de Biol. Paris Compt. Rend 94: 1130-1133. B.A. 1: [illegible]

(34) --------
1927. FIBRILLOUS COAGULATION IN VITRO OF COLLAGEN DISSOLVED IN DILUTE ACID. Acad. des. sci. Paris Compt. Rend. 184: 115-117. C.A. 21: 3372.

(35) --------
1927 STRUCTURE AND GROWTH OF FIBRILS AND FORMATION OF BUNDLES IN ARTIFICIALLY COAGULATED COLLAGEN. Soc. de Biol. Paris Compt. Rend. 96: 1268-1271. B.A. 1: 5579.

(36) --------
1931. ATTEMPT AT REPRODUCTION IN VITRO OF COLLAGEN FRAME-WORK; HYPOTHESES CONCERNING CONSTRUCTION OF THIS FRAME-WORK IN VITRO. Ann. d'Anat. Path. 8: 1-12.

(56) COLLIN, R.
1928. DIFFERENTIAL PROPERTIES OF THE COLLAGEN FIBERS OF THE CORNEA AND SCLEROTIC. Soc. de Biol. Paris Compt. Rend. 99: 833-834. C.A. 23: 885.

(57) --------
1928. DIFFERENTIAL PROPERTIES OF TENDON AND NON-TENDON COLLAGEN FIBERS. Soc. de Biol. Paris Compt. Rend. 99: 405-406.

(58) CONABERE, G. O.
1944. THE FUNDAMENTAL STRUCTURE OF HIDES, SKINS AND LEATHER. Internatl. Soc. Leather Trades Chem. Jour. 28, 270-280.

(59) CONN, H. J. and DARROW, M. A.
1943. STAINING PROCEDURES USED BY THE BIOLOGICAL STAIN COMMISSION. Geneva, Biotech. pt. I. Sect. B. Methods for Connective Tissues.

(60) COPELAND, D. E.
1943. THE SURFACE STAINING OF EMBEDDED TISSUES. Stain Technol. 18; p. 165 - 174.

(61) DOHOGNE, A.
1946. STUDY OF THE SKIN. Rev. Tech. des Ind. du Cuir 38: 193-197, 216-219, and 225-230; Rev. Tech. des Ind. du Cuir. 39: 3-6,
1947. 47-50, and 73-74.

(62) DUPLANT, F.
1935. TECHNIQUE OF STAINING COLLAGEN SUBSTANCE. Lyon Med. 156: 673-677.

(63) FRANCOIS-FRANK, L., GUYON, L. and NAGEOTTE, J.
1927. COLLAGEN FRAMEWORK IN ADULT. Bul. d'Histol. Appl. a la Physiol. et Path. et de Tech. Micros. 4: 73-92.

(64) FRANKLIN, K. J.
1932. FURTHER NOTES ON ARRANGEMENT OF COLLAGEN FIBERS OF VEINS, TOGETHER WITH CERTAIN OTHER OBSERVATIONS ON VEINS, AND ON VENOUS RETURN. Jour. Anat. London 66: 602-609.

(65) HERINGA, G. C.
1933. THE HISTOLOGY OF THE CORIUM AND THE GRAIN. Collegium. 749-754. Abstr. JALCA 30:34. Abstr. Inst. Soc. L. Trades Chem. J. 18: 260.

(48) --------
1928. THE TRANSPARENT CHAMBER OF THE RABBITS EAR GIVING A COMPLETE DESCRIPTION OF IMPROVED TECHNIQUE OF CONSTRUCTION AND INTRODUCTION, AND GENERAL ACCOUNT OF GROWTH AND BEHAVIOR OF LIVING CELLS AND TISSUES AS SEEN WITH THE MICROSCOPE. Amer. Jour. Anat. 41: 447-472.

(49) STRANGEWAYS, T. S. P.
1922. OBSERVATIONS ON CHANGES SEEN IN LIVING CELLS DURING GROWTH AND DIVISION. Roy. Soc. London, Proc. Ser. B. 94: 137-141.

(50) WOLF, J.
1926. THE ORIGIN OF COLLAGENOUS FIBERS. Acad. Tchèque Sci. Bull. Intern. Res. Trav. Présentés Cl. Sci., Math. Nat. et Med. 27: 377-384. B.A. 5: 18506.

(51) --------
1926. THE ORIGIN OF COLLAGENOUS FIBERS. Rozpravy Ceske Ved. a Umeni 35(19) 1-8 B.A. 4: 13078.

(52) --------
1930. ORIGIN OF FIBRILLAR COLLAGEN SOLUTIONS. Acad. Tchèque Sci. Bull. Internat. Res. Trav. Présentés Cl. Sci. Math., Nat. et Med. 31: 96-98. B.A. 7: 19018.

(53) --------
1930. PRODUCTION OF COLLAGEN FIBRILS IN VITRO AND WITHOUT THE PRESENCE OF CELLS BY GELATINIZATION OF FIBRILLAR SOLUTIONS. Acad. Tchèque Sci. Bull. Internat. Res. Trav. Présentés Cl. Sci. Math., Nat. et Med. 31: 381-387. B.A. 7: 19619.

(54) --------
1931.. PRODUCTION OF COLLAGEN FIBERS IN VITRO AND IN THE ABSENCE OF CELLS BY GELATINIZATION OF FIBRILLAR SOLS. (With French summary). 47 p. Nakladem Ceske Akad. Ved. a Umeni. Prague. B.A. 6: 17376.

B. HISTOLOGY AND HISTOLOGICAL TECHNIQUE

(55) ASH, J. E.
1946. TECHNICAL METHODS IN USE AT THE ARMY INSTITUTE OF PATHOLOGY. J. Tech. Methods, 26, 1-59. (Abstract in Stain Technol. 23, 46. 1948).

(76) MALLORY, F. B.
1936. **ANILINE-BLUE COLLAGEN STAIN.** Stain Technol. 11: 101-102.

(77) MALLORY, F.B. and WRIGHT, J. H.
1924. **PATHALOGICAL TECHNIQUE.** Ed. 8, 666 pp. Phila. Saunders.

(78) MAXIMOW, A. A. and BLOOM, W.
1943. **TEXTBOOK OF HISTOLOGY.** Ed. 4, 695 pp. Phila. Saunders.

(79) MENDELOFF, J. and BLECHMAN, H.
1943. **A COMBINED ELASTICS-TRICHROME STAIN FOR TISSUES.** Amer. Jour. Clin. Path. Tech. Sect. 7: 65. C.A. 37: 5750.

(80) MONSERRAT, J. L.
1935. **APPLICATION OF DEL RIO HARTEGA METHOD TO BLOCKS OF COLLAGEN AND TO PARAFFIN INCLUSIONS OF SECTIONS FIXED ON SLIDES.** Hosp. Argent. 6: 164-167.

(81) MORIN, G.
1929. **DISPOSITION OF COLLAGEN IN GLANDULAR STRUCTURE OF PANSACRAL NERVE.** Soc. de Biol. Paris Compt. Rend. 102: 787-788.

(82) --------
1929. **DISPOSITION OF COLLAGEN IN AUERBACH'S PLEXUS; PERIGANGLIONAR AND PERINEURONAL CAPSULES.** Bull. d'Histol. Applic. a la Physiol. 6: 400-411. B.A. 5: 21426.

(83) NAGEOTTE, J.
1924. **THE SOLUBILITY OF FAT SOLUBLE DYES IN SERUM.** Soc. de Biol. Paris Compt. Rend 91: 539-541. C.A. 19: 306.

(84) -------
1927. **COAGULUM AND GEL OF COLLAGEN.** Soc. de Biol. Paris Compt. Rend. 97: 559-561. B.A. 5: 3997.

(85) -------- and GUYON, L.
1933. **VARIATIONS OF SUBCUTANEOUS COLLAGEN.** Soc. de Biol. Paris Compt. Rend. 113: 1398-1401.

(66) JALOWY, B.
1937. COLLAGEN, ELASTIN AND RETICULUM OF SKIN; ATTEMPT TO EXPLAIN NATURE OF ARGYOPHILLIA OF FIBERS. Ztschr. f. Zellforsch. u. Mikro. Anat. 27: 667-690.

(67) JULLIEN, L.
1872. ON A NEW METHOD OF COLORING HISTOLOGICAL ELEMENTS. Lyon Méd., 10: 526-530.

(68) KAYE, M. and LLOYD, D. J.
1929. HISTOLOGICAL AND PHYSIO-CHEMICAL INVESTIGATION OF SWELLING OF A FIBROUS TISSUE. Roy Soc. London, Proc. Ser. B. 96: 293-316.

(69) KRAJIAN, A. A.
1933. RAPID METHOD FOR DEMONSTRATION OF RETICULUM AND COLLAGEN FIBERS IN FROZEN SECTIONS. Arch. Path. 16: 376-378.

(70) KÜNTZEL, A.
1925. HISTOLOGY OF ANIMAL SKIN. Verlag von Theodor Steinkopff, Dresden and Leipsig. 74 pp.

(71) --------
1926. FINE STRUCTURE OF COLLAGEN FIBERS. Collegium: 176-189. C.A. 20: 2919.

(72) -------- and PRAKKE, F.
1933. MORPHOLOGY AND FINE STRUCTURE OF COLLAGEN FIBERS. Biochem. Ztschr. 267: 243-295. C.A. 28: 2377.

(73) LEE, A. B.
1937. THE MICROTOMISTS' VADE MECUM. Ed. 10 - 784 pp. Phila. Blakiston.

(74) LEPLAT, G.
1935. THE APPLICATION OF HISTOLOGICAL AND HISTOCHEMICAL METHODS TO THE STUDY OF COLLAGEN FIBERS. Collegium: 513-521. JALCA 31: 391. C.A. 30: 3272.

(75) LILLIE, R. D.
1945. STUDIES ON SELECTIVE STAINING OF COLLAGEN WITH ACID ANILIN DYES. Jour. Tech. Methods. 25: 1-47.

(95) THANHOFFER, L. and UJSAGBY, P.
1932. INVESTIGATIONS WITH THE AID OF MICRO-DISSECTION ON THE SWELLING OF COLLAGEN FIBERS AND ON THE NATURE OF PRENANT'S RINGS. Ztschr. Gesamt. Anat. 1. Abt. 97: 376-381.

(96) THOMAS, J. A.
1941. A NEW SELECTIVE STAIN FOR COLLAGEN AND RETICULAR STRUCTURES; HEMATOXYLIN-DIOXANE-PHOSPHOMOLYBDIC ACID MIXTURE. Soc. de Biol. Paris Compt. Rend. 135: 934-937. C.A. 39: 5268.

(97) TROITZKA-ANDREEVA, A. M.
1930. COLLAGEN SUBSTANCES IN HUMAN ARTERIES AT VARIOUS AGES. Arch. Biol. Nauk. 30: 519-526 (In French 526-527). C.A. 25: 4602.

(98) --------
1931. RECOGNITION OF AGING CHANGES IN ARTERIES. (ON THE AGE FIBROSIS OF THE ARTERIAL WALL). Frankfurter Ztschr. Path. 41: 120-135. B.A. 6: 17413.

(99) TURLEY, H. G.
1926. A CHEMICO-HISTOLOGICAL STUDY OF LEATHER MANUFACTURE. PT. I. THE STRUCTURE AND PROPERTIES OF FRESHLY FLAYED STEER SKIN. Amer. Leather Chem. Assoc. Jour. 21: 117-156.

(100) UNNA, P. G.
1928. HISTOCHEMISTRY OF THE SKIN. Franz Deuticke. Leipzig und Wien. 163 pp. C.A. 22: 970.

(101) URTUBEY, L.
1926. NATURE OF THE COLLAGENOUS FIBERS IN THE GREAT OMENTUM OF RODENTS. R. Soc. Argene Hist. Nat. Bol. 26: 279-282. B.A. 2: 3435

(102) VALLE, G.
1935. STRUCTURAL DIFFERENCES IN NON-PREGNANT UTERUS AT VARIOUS AGES AND IN UTERUS DURING VARIOUS PERIODS OF PREGNANCY. Ginecologia 1: 773-776.

(103) VON VOLKMANN, R. and STRAUSS, F.
1934. SUBSTITUTE FOR HORNOWSKY'S COMBINATION FOR DEMONSTRATION OF ELASTIN, MUSCULAR AND COLLAGEN FIBERS ON BASIS OF AZAN STAINING METHOD. Ztschr. f. Wiss. Mikros. 51: 244-249.

(86) --------
1933. ANATOMIC AND ARTIFICIAL COLLAGEN FIBRILS. Soc. de Biol. Paris Compt. Rend. 113: 841-844.

(87) -------- and FRANCOIS-FRANCK, L. and GUYON, L.
1927. ON THE STRUCTURE AND METASTRUCTURE OF THE COLLAGEN WEAVE PATTERN IN THE ADULT. Bul. d'Histol. Appl. a la Physiol. 4: 73-92.

(88) POLICARD, A. and GALY, P.
1940. EXISTENCE OF FIBROHYALINE DEPOSITS IN THE INTERCOSTAL NERVES OF MAN. Bul. d'Histol. Appl. a la Physiol. et Path. 17: 95-96. C.A. 35: 173.

(89) RODDY, W. T.
1942. THE COAGULABLE PROTEINS OF ANIMAL SKIN. I. A HISTOLOGICAL STUDY OF THE COAGULABLE PROTEINS OF ANIMAL SKIN. Amer. Leather Chem. Assoc. Jour. 37: 410-416.

(90) --------
1942. THE COAGULABLE PROTEINS OF ANIMAL SKIN. II. PHYSICAL CHANGES OF STEER HIDE DUE TO REMOVAL OF COAGULABLE PROTEINS. Amer. Leather Chem. Assoc. Jour. 37: 416-426. C.A. 36: 7344.

(91) ROHM AND HAAS CO.
1922. SOME OBSERVATIONS ON THE HISTOLOGY OF BATED SKINS. Amer. Leather Chem. Assoc. Jour. 17: 542-554.

(92) STOPPOLONI, G.
1934. ANATOMY, STRUCTURE, MICROSCOPIC RETICULAR SYSTEMS AND PARA-GANGLIONIC INNERVATION OF KOHN IN MAN AND OTHER VERTEBRATES, Bul. Soc. Eustach. 32: 33: 97.

(93) STUDNICKA, F. K.
1931. NOTES TO THE CHAPTER OF "THE TISSUE OF THE DORSAL CHORD", BY JOS. SCHAFFER IN THE HANDBOOK OF MICROSCOPIC ANATOMY OF HUMANS BY W. V. MOLLENDORF. (VOL. II, PART 2). Anat. Anz. 72: 482-503.

(94) TENNEY, B. J.
1935. COLLAGEN OF PLACENTA. Amer. Jour. Obst. and Gynec. 29: 819-825.

(131) --------
1927. ARTIFICIAL COLLAGENOUS COAGULA; ITS SIGNIFICANCE, GENERAL MORPHOLOGY AND TECHNIQUE Soc. de Biol. Paris Compt,. Rend. 96: 172-174. B.A. 2: 5160.

(132) --------
1927. CONSTITUTION OF COLLAGENOUS COAGULA FORMED IN FEEBLY ACIDIFIED WATER; FIBRILS, SOL AND GEL. Soc. de Biol. Paris Compt. Rend 98: 464-468. B.A. 2: 5161.

(133) --------
1928. SOLUBILITY OF COLLAGEN IN DILUTE ACIDS. Soc. de Biol. Paris Compt. Rend. 98: 15-16. B.A. 5: 13726.

(134) --------
1930. COLLAGEN A AND COLLAGEN B. Soc. de Biol. Paris Compt. Rend 104: 156-159.

(135) OBERLING, C. and JENTZER, A.
1936. INTRAVASCULAR PRECIPITATION OF COLLAGEN IN PSEUDO-PAPILLARY ASTROCYTOMA OF BRAIN; CASE. Rev. Neurol. 65: 313-319.

" "
(136) OKROS, S.
1942. BEHAVIOR OF COLLAGENIC CONNECTIVE TISSUE AND OF TRANSVERSELY STRIATED MUSCULAR TISSUE IN POLARIZED LIGHT IN VARIOUS PREMORTAL AND POSTMORTAL WOUNDS. Deut. Ztschr. f. d. ges. Gerichtl. Med. 36: 160-173.

(137) PAVLOVICH, R. H.
1939 CONTRIBUTION TO THE STUDY OF THE PATHOLOGICAL METABOLISM OF COLLAGEN Ann. de Dermat. et Syph. Ser. 7; V. 6: 465-487.

(138) PAUTRIER, L. M.
1941. PATHOLOGY OF COLLAGEN AND ELASTIN OF SKIN. Presse Med. Paris 49: 737-739.

(139) PULLINGER, B. D.
1943. CORPORA AMYLACEA-LIKE BODIES IN CHRONIC INFLAMMATION DUE TO IMPLANTED COLLAGEN. Jour. Path. and Bact. 55: 99-100.

(140) -------- and PIRIE, A.
1942. CHRONIC INFLAMMATION DUE TO IMPLANTED COLLAGEN. Jour. Path. and Bact. 54: 341-344. C.A. 36: 6610.

(122) KREIS, J. and RIGAUT, O.
1930. CONNECTIVE TISSUE LESIONS PARTICULARLY OF COLLAGENIC NETWORK OF ENDOMETRIUM IN FUNCTIONAL MENORRHAGIA AND METRORRHAGIA: RELATION TO HEREDITARY SYPHILIS. Gynec. et Obst. 21: 324-365.

(123) LAMBERT, R. A.
1913. COMPARATIVE STUDIES UPON CANCER CELLS AND NORMAL CELLS. II. THE CHARACTER OF GROWTH IN VITRO WITH SPECIAL REFERENCE TO CELL DIVISION. Jour. Expt. Med. 17: 499-510.

(124) LOEB, L. SUNTZEFF, V. and BURNS, E. L.
1939. CHANGES IN THE NATURE OF THE STROMA IN VAGINA CERVIX AND UTERUS OF THE MOUSE PRODUCED BY LONG-CONTINUED INJECTIONS OF ESTROGEN AND BY ADVANCING AGE. Amer. Jour. Cancer 35: 159-174.

(125) LOISELEUR, J. and URBAIN, A.
1930. ANTIGENIC PROPERTIES OF COLLAGEN AND THEIR MODIFICATION UNDER THE INFLUENCE OF RADIUM EMANATION. Soc. de Biol. Paris Compt. Rend. 103: 776-778. C.A. 25: 1895.

(126) MACAIGNE, M. and NICAUD, P.
1930. DEFENSE ROLE AND ORGANIZATION OF ALVEOLAR CELL SCARS. ORIGIN OF COLLAGENOUS SUBSTANCE IN THE PROCESSES OF ALVEOLAR SCLEROSIS. Soc. de Biol. Paris Compt. Rend. 105: 292-295.

(127) MACFARLANE, R. G., and MACLENNAN, J. D.
1945. TOXEMIA OF GAS GANGRENE. Lancet 249: 328-331. C.A. 40: 1940.

(128) MASERITZ, I. H.
1934. DIGESTION OF BONE BY LARVAE OF PHORMIA REGINA; ITS RELATIONSHIP TO BACTERIA. Arch. Surg. 28: 589-607. B.A. 9: 18048.

(129) MYERS, V. C. and LANG, W. W.
1946. SOME CHEMICAL CHANGES IN THE HUMAN THORACIC AORTA ACCOMPANYING THE AGING PROCESS. Jour. Gerontol. 1: 441-444. C.A. 41: 6963.

(130) NAGEOTTE, J.
1927. ACTION OF NEUTRAL SALTS UPON THE FORMATION OF ARTIFICIAL CLOT IN COLLAGEN. Soc. de Biol. Paris Compt. Rend. 96: 828-830.

(112) FAURÉ-FREMIET, E. and BAUDOY, C.
1937. SOLUBILITY OF SOME COLLAGENS. Soc. de Chim. Biol. Bul. 19: 1134-1138. C.A. 31: 8888.

(113) FERIZ, H.
1940. EXPERIMENTS WITH TAMPONS AND MEMBRANES MADE OF COLLAGEN. Surgery 8: 654-661.

(114) FIESSINGER, N.
1945. DEVELOPMENT OF COLLAGEN RETICULUM IN CIRRHOSIS. Acad. de Med. Paris, Bul. 129: 478-481.

(115) HARPER, F. R.
1929. CHRONIC DERMATOSIS WITH DEGENERATION OF COLLAGEN; REPORT OF CASE. Arch. Dermat. and Syph. 20: 201-211.

(116) HAYASHI, S.
1935. MATHEMATICAL RELATION OF HYPERPHASIA OF INTIMA; INCREASE AND THICKENING OF COLLAGENIC FIBERS IN ARTERIOSCLEROSIS. Soc. Path. Jap. Trans. 25: 538-2[illegible].

(117) HERTZLER, A. E.
1915. THE DEVELOPMENT OF FIBROUS TISSUE IN PERITONEAL ADHESIONS. Anat. Rec. 9: 85.

(118) HOMBERGER, E.
1936. SIGNIFICANCE OF COLLAGEN IN THE HUMAN BODY. Fortsch. Med. 54: 369-372.

(119) HOWES, E. L.
1946. CARCINOGENS AND THE REGENERATION PATTERNS AFTER INJURY. Cancer Res. Arch. 6: 298-310. C.A. 41: 199.

(120) KLEMPERER, P. POLLACK, A. D. and BAEHR, G.
1941. PATHOLOGY OF DISSEMINATED LUPUS ERYTHEMATOSUS. Arch. Path. 32: 569-[illegible]. C.A. 3[illegible]: 5850.

(121) --------, --------, --------
1942. DIFFUSE COLLAGEN DISEASE: ACUTE DISSEMINATED LUPUS ERYTHEMATOSUS AND DIFFUSE SCLERODERMA. Amer. Med. Assoc. Jour. 119: 331-332.

(104) WILSON, J. A.
1929. THE CHEMISTRY OF LEATHER MANUFACTURE. Ed. 2. Vol. 1, New York Chem. Cat. Co.

(105) ZITZLSPERGER, S.
1941. NEW AND SIMPLE PROCEDURE FOR DEMONSTRATION OF COLLAGENIC AND AGRYROPHILL FIBERS OF CONNECTIVE TISSUE. Ztschr. f. Wiss. Mikros. 57: 409-414.

C. PHYSIOLOGY AND PATHOLOGY

(106) ABERCROMBIE, M. and JOHNSON, M. L.
1946. COLLAGEN CONTENT OF RABBIT SCIATIC NERVE DURING WALLERIAN DEGENERATION. Jour. Neurol. Neurosurg. Psychiat. 9: 113-118. C.A. 41: 6962.

(107) BIERICH, R. and ROSENBOHN, A.
1924. THE BIOCHEMISTRY OF CANCER FORMATION. Biochem. Ztschr. 152: 193-202. C.A. 19: 1594.

(108) BUCHER, R. and STRAUMANN, R.
1938. IMPORTANCE OF STRUCTURE OF COLLAGEN FIBER FOR THE NORMAL AND PATHOLOGICAL PRECIPITATION OF LIME. Schweiz, Med. Wchnschr. 67 (28): 619. Abstract in Neues Jahrb. Mineral. Geol. Ref. 1. 1938: 220-1. C.A. 33: 2967.

(109) DOLFINI, G.
1929. THE STAGE PRECEDING COLLAGEN FORMATION IN THE ORGANIZATION OF A THROMBUS. Arch. Sci. Med. 53: 120-128. B.A. 4: 8264.

(110) ELDER, F. R. and GIES, W. J.
1912. STUDIES OF ENZYMES AS POSSIBLE FACTORS IN DEVELOPMENT OF EDEMA. IV. THE INFLUENCE OF PROTEASES ON THE SWELLING OF COLLAGEN AND FIBRIN PARTICLES IN ALKALINE AND ACID MEDIA CONTAINING A BIOLOGICAL ELECTROLYTE. Biochem. Bul. 1: 540-545. C.A. 6: 2940.

(111) ESPIN, J.
1945. BEHAVIOR OF PRECOLLAGEN RETICULUM IN BILHARZIAL. CIRRHOSIS. Trab. d. Centro invest. cient. no. 3: 31-50.

(169) -------- and HOOFT, C.
1933. **STRUCTURE AND SIGNIFICANCE OF CONNECTIVE TISSUE; COLLAGEN AND RETICULIN.** Nederland. Tijdschr. v. Geneesk. 77: 1188-1192.

(170) -------- --------
1933. **CELLULAR AND INTERSTITIAL CELL SUBSTANCE.** Bul. Histol. Appl. a la Physiol. 10: 137-154.

(171) -------- and WEIDINGER, A.
1940. **STRUCTURE AND IMPORTANCE OF CONNECTIVE TISSUE. XII. COLLAGEN AND RETICULIN AND THEIR RELATIONSHIP TO THE WATER BINDING IN CONNECTIVE TISSUE.** Nederland. Tijdschr. v. Geneesk. 84: 5117-5119. C.A. 35: 2946.

(172) HOPPE-SEYLER, E., F., I.
1853. **ON THE TISSUE ELEMENTS OF CARTILAGE, BONE AND TEETH.** Virchows Archiv fur Pathologische Anatomie und Physiologie. 5: 170-189.

(173) KAYE, M.
1936. **THE RETICULAR TISSUE OF THE SKIN.** Internatl. Soc. Leather Trades Chem. Jour. 20: 223-229. C.A. 30: 4716.

(174) KÜNTZEL, A. and SEITZ, A.
1936. **ON THE OCCURRENCE OF RETICULIN IN THE HIDE.** Collegium: 567-570. JALCA 32: 795.

(175) LAGUESS, E.
1921. **THE LAMELLAR STRUCTURE AND THE DEVELOPMENT OF LOOSE CONNECTIVE TISSUE, IN MAMMALS IN GENERAL, AND IN MAN IN PARTICULAR.** Arch. de Biol. 31, 173-298.

(176) MALL, F. P.
1902. **ON THE DEVELOPMENT OF CONNECTIVE TISSUES FROM THE CONNECTIVE-TISSUE SYNCYTIUM.** Amer. Jour. Anat. 1: 329-365.

(177) MALLORY, F. B.
1903. **A HITHERTO UNDESCRIBED FIBRILLAR SUBSTANCE PRODUCED BY CONNECTIVE-TISSUE CELLS.** Jour. Med. Res. 10: 334-341.

(159) CORNER, G. W.
1920. **ON THE WIDESPREAD OCCURRENCE OF RETICULAR FIBRILS PRODUCED BY CAPILLARY ENDOTHELIUM.** Carnegie Inst. Contrib. to Emb. ix, No. 272, 85-93.

(160) DERKSEN, J. C. and HERINGA, G. C.
1936. **FIBROUS PROTEINS OF MAMMALIAN EPIDERMIS.** Szymonowicz festschr. Polska Caz. Lekarska 15: 572.

(161) DOLJANSKI, L. and ROULET, F.
1933. **STUDIES ON THE ORIGIN OF CONNECTIVE TISSUE FIBRILS.** Virchows Arch. f. Path. Anat. u. Physiol. 291: 290-320.

(162) -------- --------
1934. **THE PROBLEM OF THE ORIGIN OF CONNECTIVE TISSUE STRUCTURES.** Arch. f. Entwick. 131: 512-531.

(163) ETTISCH, G. and SVEGVARI, A.
1927. **MINUTE STRUCTURE OF COLLAGENIC FIBRILS OF CONNECTIVE TISSUE.** Protoplasma 1: 214-238.

(164) FLEMMING, W.
1876. **ANATOMY AND PHYSIOLOGY OF CONNECTIVE TISSUES.** Arch. f. mikr. Anat. 12: 391-512.

(165) FOOT, N. C.
1928. **CHEMICAL CONTRASTS BETWEEN COLLAGENOUS AND RETICULAR CONNECTIVE TISSUE.** Amer. Jour. Path. 4: 525-544.

(166) GILLETTE, E. P.
1872. **ANATOMY AND PHYSIOLOGY OF CONNECTIVE OR LAMINAR TISSUE.** Paris 98 pp. Germer bailliere, Libraire Éditeur.

(167) HERINGA, G. C.
1931. **FUNCTIONAL ADAPTATION OF CONNECTIVE TISSUES.** Gesell. Verhandl. 10: 128-132.

(168) --------
1933. **RETICULIN AND COLLAGEN.** Ztschr. f. Mikros.-Anat. Forsch. 34: 459-484.

(150) -------- and HETT, O.
1938. THERMOELASTIC PROPERTIES OF MUSCLE FIBERS AND COLLAGENIC FIBERS IN CONDITION OF ACID CONTRACTION. Arch. f. d. Gesamt. Physiol. 240: 82-88.

(151) WOLBACH, S. B.
1933. CONTROLLED FORMATION OF COLLAGEN AND RETICULUM; A STUDY OF THE SOURCE OF INTERCELLULAR SUBSTANCE IN RECOVERY FROM EXPERIMENTAL SCORBUTUS. Amer. Jour. Path. 9: 689-700.

(152) --------
1936. VITAMIN C AND THE FORMATION OF INTRACELLULAR MATERIAL. New Eng. Jour. Med. 215: 1158-1159. C.A. 31: 6295.

(153) -------- and HOWE. P.
1926. INTERCELLULAR SUBSTANCES IN EXPERIMENTAL SCORBUTUS. Arch. Pat. and Lab. [illegible] C.A. 20: 1663.

(154) WOLFE, J. M. and WRIGHT, A. W.
1942. FIBROUS CONNECTIVE TISSUE OF ARTIFICIALLY INDUCED MATERIAL PLACENTA IN RAT WITH PARTICULAR REFERENCE TO RELATIONSHIP BETWEEN RETICULUM AND COLLAGEN. Amer. Jour. Path. 18: 431-461.

(155) ZURHELLE, E.
1936. WAVE-LIKE COURSE OF RADIUM ERYTHEMA AS WELL AS PARADOXIC PALLOR REACTION TO RADIUM ON COMB AND WATTLES OF COCK RESULTING FROM COLLAGEN CHANGES. Strahlentherapie 57: 473-487.

D. CONNECTIVE TISSUE. ELASTIN AND RETICULIN

(156) AMPRINO, R.
1938. STUDIES ON THE MECHANICAL SIGNIFICANCE OF THE COLLAGENOUS FIBERS OF THE HYALIN CARTILAGE OF MAN. Ztschr. f. Zellforsch [illegible] 28: 734-76[illegible] B.A. 13: 9706.

(157) BENNINGHOFF, A.
1931. FUNCTIONAL ADAPTATION IN CONNECTIVE TISSUE. Deut. Anat. Gesell. Verhandl. [illegible] 123 (Erganz. Anat. Anz. Bd. 72).

(158) BENSLEY, S. H.
1934. ON THE PRESENCE, PROPERTIES AND DISTRIBUTION OF THE INTERCELLULAR GROUND SUBSTANCE OF LOOSE CONNECTIVE TISSUE. Anat. Rec. 60, 93-109

(141) RADICE, J. C.
1939. CONDITION OF RETICULUM, COLLAGEN AND ELASTIN FIBERS OF LUNG WITH PRIMARY CANCER. Arch. Soc. Argent. de Anat. Norm. y Pat. 1: 573-585. Also in: Rev. Assoc. Med. Argent. 54: 543-547. 1940.

(142) RATHERY, F., DOUBROW, S., FERROIR, J., and TIFFENEAU, R.
1939. FIBRINOUS DEGRADATION OF COLLAGEN IN ALLERGIC INFLAMMATION. Soc. de Biol. Paris Compt. Rend. 131: 1261-1263. C.A. 34: 6846.

(143) ROBERTSON, W. V. B., ROPES, M. W., and BAUER, W.
1942. ACTION OF ASCORBIC ACID AND HYDROGEN PEROXIDE ON COLLAGEN AND THYMONUCLEOHISTONE. Soc. Expt. Biol. and Med. Proc. 49: 687-688. C.A. 36: 4139.

(144) SCHOSNIG, F.
1932. MORPHOLOGIC CHANGES IN COLLAGENIC FIBERS OF CONNECTIVE TISSUE IN FIBRILLAR RHEUMATISM AND OTHER INFLAMMATORY CONDITIONS. Virchows Arch. f. Path. Anat. u. Physiol. 286: 291-302.

(145) VASSOS, G. A.
1940. PHAGOCYTOSIS OF COLLAGEN. Arch. Path. 30: 868-872.

(146) WAIL, S.
1928. PATHOLOGY OF COLLAGEN DEGENERATION OF CONNECTIVE TISSUE. Virchows Arch. f. Path. Anat. 267: 1-8.

(147) WERNER, M. (Kiel)
1938. CAUSES OF SWELLING OF COLLAGEN FIBERS IN HYPERERGIC INFLAMMATION (ARTHUS PHENOMENON). Virchows Arch. f. Path. Anat. 301: 571-574.

(148) WÖHLISCH, E. and DE ROCHEMONT, R. D.
1926-27. INVESTIGATIONS ON THE ELASTIC AND THERMODYNAMIC PROPERTIES OF CONNECTIVE TISSUE. Beitr. z. Path. Anat. 76: 233-237.

(149) --------
1927. INVESTIGATIONS ON ELASTIC, THERMODYNAMIC, MAGNETIC AND ELECTRIC PROPERTIES OF ANIMAL TISSUE. Ber. Ges. Physiol. 39: 328-329. Also in Verhand. d. Physikal. Med. Ges. Wurzburg 51: 53-64. C.Z. 1927 II: 1038-39.

(188) RICHARDS, A. N. and GIES, W. J.
1902. ELASTIN, MUCOID AND OTHER SUBSTANCES IN ELASTIC TISSUE. Amer. Jour. Physiol. 7: 93-134.

(189) RINEHART, J. F.
1930. RETICULUM; ITS ORIGIN. THE OCCURRENCE OF RETICULUM FIBRILS IN CAPILLARY ENDOTHELIUM. A NEW METHOD OF DEMONSTRATION. II. THE FINER CAPILLARY BED. Amer. Jour. Path. 6: 523-539. B.A. 6: 17571.

(190) RUF, R.
1934. CONTINUOUS DETERMINATION OF THE CONDUCTIVITY RESISTANCE OF SUBCUTANEOUS CONNECTIVE TISSUES OF WARM BLOODED ANIMALS. Jena. 15 pp. 1934.

(191) SCHMIEDEBERG, O.
1920. RELATION OF HYALOIDIN TO THE FORMATION OF CHONDROITIN-SULFURIC ACID, COLLAGEN AND AMYLOID IN THE BODY. Arch. Expt. Path. Pharm. 87: 47-73. B.A. 15: 578.

(192) SIEGFRIED, M.
1902. RETICULIN AND COLLAGEN. Jour. Physiol. 28: 319-324. Chem. Soc. London, Jour. 82 (II) 517A. 1902.

(193) STANDENATH, F.
1927/28. CONNECTIVE TISSUE; ITS DEVELOPMENT, STRUCTURE AND IMPORTANCE IN PHYSIOLOGY AND PATHOLOGY. Ergeb. der Allg. Path. Mensch u. Tiere. Abt. 2, 22: 76-200.

(194) STEARNS, M. L.
1940. STUDIES ON THE DEVELOPMENT OF CONNECTIVE TISSUE IN TRANSPARENT CHAMBERS IN THE RABBITS EAR. Pt. I. Amer. Jour. Anat. 66: 155-177.

(195) --------
1940. STUDIES ON THE DEVELOPMENT OF CONNECTIVE TISSUE IN TRANSPARENT CHAMBERS IN THE RABBITS EAR. Pt. II. Amer. Jour. Anat. 67: 55-97.

(196) STUDNICKA, F. K.
1933. FRESH MESOSTROMA, MESENCHYME AND CONNECTIVE TISSUE OF VERTEBRATES. Soc. de Biol. Paris Compt. Rend. 114: 826-828.

(178) -------- and PARKER, F.
1927. RETICULUM. Amer. Jour. Path. 3: 515-525. B.A. 4: 29426

(179) MAXIMOW, A. A.
1902. EXPERIMENTAL INVESTIGATIONS ON THE INFLAMMATORY REGENERATION OF CONNECTIVE TISSUE. Jena, G. Fischer. 262 pp. (Forms Suppl. hft 5 of Beitrage z. Path. Anat. u. z. Allg. Path).

(180) NAGEOTTE, J.
1916. THE FUNDAMENTAL SUBSTANCE OF CONNECTIVE TISSUE IS A COAGULUM OF PROTEINS. Soc. de Biol. Paris Compt. Rend. 79: 833-839. C.A. 11: 1979.

(181) --------
1919. ORGANIC MATTER AND LIFE; LIGHT THROWN UPON LIFE PROCESSES BY THE STUDY OF CONNECTIVE TISSUE. Sci. Amer. 87: Suppl. 362.

(182) --------
1922. THERE IS NO AMPHOROUS SUBSTANCE IN SUBCUTANEOUS CONNECTIVE TISSUE. Soc. de biol. Paris Compt. Rend. 87: 147-149.

(183) -------- and GUYON, L.
1931. GENERAL CONSIDERATIONS ON SUBCUTANEOUS CONNECTIVE TISSUE. Arch. de Biol. 41: 1-35.

(184) O'FLAHERTY, F.
1937. MICROBIOLOGICAL STUDY OF COLLAGEN AND ELASTIN. Stiasny Festschr: 267-281. C.A. 32: 8185.

(185) ODIETTE, D.
1933. CONTRIBUTION TO THE STUDY OF THE ELASTIC SUBSTANCE IN TISSUE CULTURES IN VITRO. Paris, Aurillac 98 pp.

(186) PASQUALINO, A.
1935. THE CONNECTIVE TISSUE IN THE DIFFERENT MUSCLES. Arch. Ital. Anat. e. Emb. 35: 146-160. B.A. 10: 22186.

(187) POPA, G. T.
1936. THE ANATOMY OF THE CONNECTIVE TISSUE SYSTEM. Morph. Jahrb. 78: 79-84.

(207) --------
1936. **X-RAY STUDIES OF PROTEIN STRUCTURE.** Nature, London, 137: 803-805.

(208) --------
1936. **RECENT ADVANCES IN X-RAY STUDY OF PROTEIN FIBERS.** Textile Inst. Jour. 27: P 282-297.

(209) --------
1936. **X-RAY INTERPRETATION OF PROTEIN STRUCTURE.** Chem. Weekly 33: 778-83. C.A. 31: 1441.

(210) --------
1938. **X-RAY ADVENTURES AMONG THE PROTEINS.** Faraday Soc. Trans. 34: 378-388.

(211) --------
1938. **PROTEIN STRUCTURE FROM THE VIEWPOINT OF X-RAY ANALYSIS.** Carlsberg Lab. Compt. Rend. des Trav. Ser. Chim. 22: 45-53. C.A. 32: 6264.

(212) --------
1939. **X-RAY STUDY OF PROTEINS AND RELATED STRUCTURES.** Sci. Prog. 34: 1-19. C.A. 33: 6357.

(213) --------
1940. **THE MOLECULAR STRUCTURE OF THE FIBERS OF THE COLLAGEN GROUP (FIRST PROCTER MEMORIAL LECTURE).** Internatl. Soc. Leather Trades Chem. Jour. 24: 69-92. C.A. 34: 3531.

(214) --------
1940. **THE HYDROGEN BOND IN PROTEIN STRUCTURES.** Faraday Soc. Trans. 36: 871-880.

(215) --------
1943. **X-RAYS AND THE STOICHIOMETRY OF THE PROTEINS. V. THE COLLAGEN GROUP (99).** Advances in Enzymol. 3: 91-96. New York Interscience.

(216) --------
1943-44. **FIBRES AND FABRICS, OLD AND NEW.** Proc. Roy. Inst. 33: 140-149.

(197) TEBB, M. C.
1902. **RETICULIN AND COLLAGEN.** Jour. Physiol. 27: 463-472. Chem. Soc. London, Jour. Abstr. 1902 II: 218 A.

(198) TECHOUEYRES, E.
1933. **CONNECTIVE TISSUE AND INTERCELLULAR SUBSTANCE.** Jour. Physiol. Path. Gen. 31: 100-116, **also, PATHOLOGIC REACTIONS OF CONNECTIVE TISSUE AND INTERCELLULAR SUBSTANCE.** Jour. Physiol. Path. Gen. 31: 117-1304.

(199) --------
1936. **GENERAL CONSIDERATIONS ON CONNECTIVE TISSUE.** Union Med. Nord Est. 59: 145-157.

(200) UNNA, P. G.
1894. **ON ELASTIN, ELACIN, BASOPHIL COLLAGEN AND COLLACIN.** Apoth. Ztg. 9: 920. C.Z. 1895 I: 156.

(201) URTUBEY, L.
1933. **CELLULAR AND INTERSTITIAL SUBSTANCE.** Bul. d'Histol. Appl. a la Physiol. et. Path. et de Tech. Micros. 10: 224-225.

(202) VANDEGRIFT, G. W. and GIES, W. J.
1901. **THE COMPOSITION OF YELLOW FIBROUS CONNECTIVE TISSUE.** Amer. Jour. Physiol. 5: 287-297.

(203) WEISS, P.
1933. **FUNCTIONAL ADAPTATION AND THE ROLE OF GROUND SUBSTANCE IN DEVELOPMENT.** Amer. Nat. 67: 322-340.

SECTION II. BIOPHYSICS

(204) ASTBURY, W. T.
1933. **SOME PROBLEMS IN THE X-RAY ANALYSIS OF THE STRUCTURE OF ANIMAL HAIR AND OTHER PROTEIN FIBERS.** Faraday Soc. Trans. 29: 193-211.

(205) --------
1934. **RÖENTGENOSCOPY OF PROTEIN FIBERS.** Kolloid-Ztschr. 9: 340-51. C.A. 29: 2818.

(206) --------
1934. **X-RAY STUDIES OF PROTEIN STRUCTURE.** Cold Spring Harbor Symposia 2: 15-27. C.A. 29: 8026..

(226) CHAMPETIER, G. and FAURE-FREMIET, E.
1938. X-RAY STUDY OF SOME COLLAGENS. Jour. de Chim. Phys. 35: 223-32. C.A. 33: 650.

(227) -------- --------
1938. X-RAY STUDY OF SECRETED KERATINS. Acad. des Sci., Paris, Compt. Rend. 207: 1133 5. C.A. 33: 1773.

(228) CHESLEY, K. G., ANDERSON, H. V., and THEIS, E. R.
1932. X-RAY STUDIES OF ANIMAL SKIN. I. STRUCTURE OF CALFSKIN AS INDICATED BY MOLYBDENUM RADIATION. Amer. Leather Chem, Assoc. Jour. 27: 12-22.

(229) CLARK, G. L.
1926. X-RAY CONTRIBUTIONS TO THE ANALYSIS OF THE STRUCTURE OF RUBBER AND ALLIED MATERIALS. Indus. and Engin. Chem. 18: 1131-1136. C.A. 20: 3607.

(230) --------
1926. X-RAYS AND COLLOIDS. Fourth Colloid Symposium Monograph. 145-173. C.A. 21: 3018.

(231) --------
1934. MACROMOLECULE AND THE MICELLE AS STRUCTURAL UNITS IN BIOLOGICAL MATERIALS, WITH SPECIAL REFERENCE TO CELLULOSE. Cold Spring Harbor Symposia 2: 28 38. C.A. 29: 7734.

(232) --------
1937. ANALYSIS BY X-RAYS OF ULTIMATE STRUCTURES OF LIVING MATERIALS. Biodynamica [illegible]. 22 pp. C.A. 31: 7897.

(233) --------
1938. ANALYSIS BY X-RAYS OF ULTIMATE STRUCTURES OF LIVING MATERIALS. [illegible] Radiologica 3: 1-16. 1938. C.A. [illegible]

(234) -------- and SCHAAD, J. A.
1936. X-RAY DIFFRACTION STUDIES OF TENDON AND INTESTINAL WALL COLLAGEN. [illegible] 27 [illegible] 56. C.A. 30: 7449.

(235) -------- BAYLOR, M. G., MARTIN, D. E., and RAFFERTY, G. T.
1945. THE ELECTRON MICROSCOPE IN DERMATOLOGY. Arch Dermat. and Syph. 51: [illegible]-89.

(217) -------- ATKIN, W. R.
1933. **X-RAY INTERPRETATION OF THE MOLECULAR STRUCTURE OF GELATIN.** Nature, London, 132: 348.

(218) -------- BELL, F. O.
1940. **MOLECULAR STRUCTURE OF THE COLLAGEN FIBERS.** Nature (London) 145: 421-422. (A more detailed discussion will be found in the Procter Memorial Lecture q. v. J. Intern. Soc. Leather Trades. Chem. 24: 69-92. (1940).

(219) -------- and LOMAX, R.
1935. **X-RAY STUDY OF HYDRATION AND DENATURATION OF PROTEINS.** Chem. Soc. (London). Jour. 840-851.

(220) -------- and STREET, A.
1931. **X-RAY STUDIES OF THE STRUCTURE OF HAIR, WOOL AND RELATED FIBERS. I. GENERAL.** Roy. Soc. London, Phil. Trans., Ser. A. 230: 75-101. C.A. 25: 4400.

(221) -------- and WOODS, H. J.
1933. **X-RAY STUDIES ON THE STRUCTURE OF HAIR, WOOL AND RELATED FIBERS. II. MOLECULAR STRUCTURE AND ELASTIC PROPERTIES OF HAIR KERATIN.** Roy. Soc. London. Phila. Trans. A. 232: 333-394. C.A. 28: 3238.

(222) -------- --------
1937. **THE STRUCTURE OF KERATIN FIBERS.** Textile Inst. Jour. 28 P 394-399.

(223) BEAR, R. S.
1942. **LONG X-RAY DIFFRACTION SPACINGS OF COLLAGEN.** Amer. Chem. Soc. Jour. 64: 727. C.A. 36: 2464.

(224) --------
1944. **X-RAY DIFFRACTION STUDIES ON PROTEIN FIBERS. I. THE LARGE FIBER-AXIS PERIOD OF COLLAGEN.** Amer. Chem. Soc. Jour. 66: 1297-1300.

(225) --------
1944. **X-RAY DIFFRACTION STUDIES ON PROTEIN FIBERS. II. FEATHER RACHIS, PORCUPINE QUILL TIP AND CLAM MUSCLE.** Amer. Chem. Soc. Jour. 66: 2043-2050.

(246) -------- and WEIDLINGER, A.
1941/1942. RETICULIN AND COLLAGEN. Acta Neerland. Morphol. 4: 291-305. C.A. 41: 5159.

(247) --------, KARSSEN, A. and WARNS, E. H. J.
1933. INTERFERANCE AND BROWNIAN MOVEMENT IN CONNECTIVE TISSUE FIBRILS. Protoplasma 20: 216-227.

(248) HERRMANN, K., GERNGRODS, O., and ABITZ, W.
1930. X-RAY STUDIES OF THE STRUCTURE OF GELATIN MICELLES. Ztschr. Physik. Chem. B 10: 371-394. C.A. 25: 632.

(249) HERZOG, R. O. and CONNELL, H. W.
1925. COLLAGEN. X-RAY EXAMINATION. Deut. Chem. Gesell. Ber. 58 B: 2228-2230. C.A. 20: 528.

(250) -------- and JANCKE, W.
1931. NOTE ON THE RÖNTGEN DIAGRAM OF COLLAGEN (FIBER PERIOD). Ztschr. Physk. Chem. B 12: 228-229. C.A. 25: 2900.

(251) HIGHBERGER, J. H. and KERSTEN, H. J.
1938. X-RAY SPECTROGRAPHIC STUDIES OF TANNING PROCESSES. I. ALTERATIONS PRODUCED IN THE COLLAGEN DIAGRAM BY VEGETABLE AND CHROME TANNING. Amer. Leather Chem. Assoc. Jour. 33: 16-26. C.A. 32: 3054.

(252) -------- --------
1939. SIMILARITY OF THE X-RAY PATTERNS OF TANNED AND MECHANICALLY DEFORMED COLLAGEN FIBERS. Nature 143: 1067. C.A. 33: 7145.

(253) HUGGINS, M. L.
1943. STRUCTURE OF FIBROUS PROTEINS. Chem. Rev. 32: 195-218. C.A. 37: 1292.

(254) HUZELLA, T.
1931. ACTIVE ELASTICITY OF LATTICE FIBER SYSTEMS. Anat. Anz. 72: 178-201.

(255) JAKUS, M. A.
1945. THE STRUCTURE AND PROPERTIES OF THE TRICHOCYSTS OF PARAMECIUM. Jour. Exptl. Zool. 100: 457-480. B.A. 20: 11, 432

(236) --------, PARKER, E. A., SCHAAD, J.A., and WARREN, W. J.
1935. NEW MEASUREMENTS OF PREVIOUSLY UNKNOWN LARGE INTERPLANAR SPACINGS IN NATURAL MATERIALS. Amer. Chem. Soc. Jour. 57: 1509. C.A. 29: 4813.

(237) CLARK, J. H.
1931. A STUDY OF TENDONS, BONES AND OTHER FORMS OF CONNECTIVE TISSUE BY MEANS OF X-RAY DIFFRACTION PATTERNS. Amer. Jour. Physiol. 98: 328-337. C.A. 25: 5683.

(238) COREY, R. B. and WYCKOFF, R. W. G.
1936. LONG SPACINGS IN MACROMOLECULAR SOLIDS. Jour. Biol. Chem. 114: 407-414.

(239) FREY-WYSSLING, A.
1939. MICELLAR CONCEPT. Chron. Bot. 5: 9, 10. B.A. 13: 17689.

(240) GERNGROSS, O. and KATZ, J. R.
1926. PREPARATIONS OF STRONGLY STRETCHED GELATIN PREPARATION AND THEIR X-RAY DIAGRAMS. GELATIN AND COLLAGEN. Kolloid-Ztschr. 39: 181-183. C.A. 20: 3008.

(241) GERNGROSS, O. and KATZ, J. R.
1926. X-RAY SPECTROGRAPHIC INVESTIGATIONS OF THE HEAT CONTRACTION (SO-CALLED "SCHNURREN") OF UNTANNED AND FORMALDEHYDE-TANNED TENDONS. Kolloid Chem. Beihefte. 23: 368-376. C.A. 20: 3855. Also in Collegium 1926: 505-511. (Abstr. fr. J.A.L. C.A. 23: 164 (1928).

(242) GIROUD, A. and CHAMPETIER, G.
1936. RESEARCHES ON THE X-RAY DIFFRACTION PATTERNS OF KERATINS. Soc. de Chim. Biol. Bul. 18: 656-664,

(243) HÄGGQVIST, G.
1926. A CONTRIBUTION OF THE QUESTION OF HOW THE FORCE OF CONTRACTION IS TRANSMITTED TO THE TENDON. Jahrb. Morph. u. Mikrosk. Anat. Abt. 4: 205-214. B.A. 2: 10746.

(244) HALL, C. E., JAKUS, M. A., and SCHMITT, F. O.
1942. ELECTRON-MICROSCOPE OBSERVATIONS OF COLLAGEN. Amer. Chem. Soc. Jour. 64: 1834. C.A. 36: 4001.

(245) HERINGA, G. C. and KOLKMEIJER, N. H.
1926. PHYSICO-CHEMICAL STRUCTURE OF THE COLLAGENIC SUBSTANCE. III. X-RAY INVESTIGATION. K. Akad. van Wetensch. te Amsterdam. Verhandel. 29: 1092-1094. B.C.A. 1927: 203. C.A. 21: 3373.

(266) PETERSEN, H.
1926. CHANGE OF FORM IN BENT RODS OF VARIOUS MATERIALS WITH APPLICATIONS TO ELASTIC AND COLLAGENOUS FIBERS OF ANIMAL TISSUE. Naturwissenschaften 14: 605-607. B.A. 2: 3427.

(267) PICKEN, L. E. R.
1940. THE FINE STRUCTURE OF BIOLOGICAL SYSTEMS. Biol. Rev., Cambridge Phil. Soc. 15: 133-167. C.A. 34: 5097.

(268) POHLMAN, R. and WOLPERS, C.
1944. BEHAVIOR OF HISTOLOGICAL SUSPENSIONS IN A SUPERSONIC FIELD. Kolloid Ztschr. 109: 106-112. C.A. 41: 2962.

(269) PORTER, K. R., CLAUDE, A., and FULLAM, E. F.
1945. A STUDY OF TISSUE CULTURE CELLS BY ELECTRON MICROSCOPY. Jour. Expt. Med. 81: 233-246.

(270) PREBUS, A. F.
1944. ELECTRON MICROSCOPE. In Alexander. Colloid Chem. Theory and Methods. v. 5: 152-235.

(271) RUDALL, K. M.
1936. X-RAY AND RELATED STUDIES ON THE FORM AND CONSTITUTION OF THE BIOLOGICAL CELLS IN WOOL AND OTHER KERATIN STRUCTURES. Thesis, Ph. D. Leeds Univ. (no pages given - ref. identified in Leeds Univ. List of Dissertations 1936).

(272) SCHMITT, F. O.
1944. X-RAY AND ELECTRON-MICROSCOPE STUDIES OF THE STRUCTURE OF COLLAGEN FIBERS. Amer. Leather Chem. Assoc. Jour. 39: 430-41. C.A. 39: 1560.

(273) --------
1945. ULTRASTRUCTURE AND THE PROBLEM OF CELLULAR ORGANIZATION. The Harvey Lectures, 40: 249-268.

(274) -------- HALL, C. E., and JAKUS, M. A.
1942. INVESTIGATION OF COLLAGEN BY ELECTRON MICROSCOPE. Jour. Cellular Comp. Physiol. 20: 11 [illegible]. C.A. 37: 6281.

(275) -------- --------- and --------
1943. THE ULTRA STRUCTURE OF PROTOPLASMIC FIBRILS. Biological Symposia 10: 261-276.

(256) KATZ, J. R.
1934. GELATIN, COLLAGEN AND LEATHER. Russ.-Deut. Nachr. Wiss. Techn. (Russkogermanski Vestnik Nauki i Techniki) 1935 (4) 22-25. C.Z. 1935 II: 3189.

(257) -------- and GERNGROSS, O.
1931. X-RAY STUDIES OF GELATIN, GLUE AND ORGANIC FIBERS. Collegium: 67 69. C.A. 25: 4736.

(258) -------- and ROOY, A. de
1933. X-RAY DIAGRAM OF FIBRIN. Rec. des Trav. Chim. des Pays-Bas. 52: 742-746. C.A. 27: 4987.

(259) KOISI, S.
1941. RÖNTGEN-HISTOLOGICAL INVESTIGATION OF HUMAN TISSUE. Mitt. Med. Akad. Kioto 21: 859 865 (In Japanese) (In German, p. 1076). C.A. 35 [illegible].

(260) KOTOV, M. P., BUCHKOVSKII, M. V., and FOKINA, N. S.
1937. X-RAY STUDY OF THE CHANGES IN THE FINE STRUCTURE OF COLLAGEN FIBER UNDER THE EFFECT OF PRETANNING OPERATIONS. Colloid Jour [illegible] 3: [illegible]. C.A. 32: 6903.

(261) KRATY, O. and SEKORA, A.
1943. DETECTION OF LARGE DISTANCES BETWEEN LATTICE PLANES IN KANGAROO TAIL TENDONS. MOLECULAR STRUCTURE OF FIBER PROTEINS. Jour. Biochemo. Chem. [illegible]: 113-121, C.A. 38: 1256.

(262) KÜNTZEL, A.
1925. REVERSAL OF DOUBLE REFRACTION OF COLLAGEN FIBERS BY SOME VEGETABLE TANNINS. Kolloid-Zeitschrift: 623-627. C.A. 20: 1337.

(263) LAMARQUE, P
1943. STUDY OF HUMAN BONE BY DIFFRACTION X-RAY. Acad. des Sci. (Paris) Compt. rend. 216: 804 805. C.A. 38: 4623.

(264) MEYER, K. H.
1929. FINE STRUCTURE, FIRMNESS AND CONTRACTILITY OF ANIMAL TISSUES. Biochem. Zeitschr. 204: 253-281. C.A. 24: 635.

(265) -------- and FERRI, C.
1936. THE ELASTIC PROPERTIES OF ELASTIC AND COLLAGEN FIBERS AND THEIR MOLECULAR SIGNIFICANCE. Arch. ges. Physiol. (Pflügers) 238: 78-90. C.A. 31: 1830.

(286) DEFORGE, A.
1934. CHEMISTRY OF SKIN. Halle aux Cuirs (Suppl. Tech.) 100, 121, 125, 173. JALCA 30: 499. 1935. C.Z. 1934 II: 1504. 1934 II: 2542.

(287) EICHELBERGER, L. and BROWN, J. D.
1945. FAT, WATER, CHLORIDE, TOTAL N, AND COLLAGEN N CONTENT IN THE TENDONS OF THE DOG. Jour. Biol. Chem. 158: 283-289. C.A. 39: 2551.

(288) EISELE, W. and EICHELBERGER, L.
1945. WATER, ELECTROLYTE AND N CONTENT OF HUMAN SKIN. Soc. Expt. Biol. and Med. Proc. 58: 97-100. C.A. 39: 1675.

(289) HALL, J. L., LOY, H. W., MACKINTOSH, D. L., VAIL, G. E., and LATSCHAR, C. E.
1944. QUALITY OF BEEF. III. EFFECT OF FEEDING LIMESTONE SUPPLEMENT ON QUALITY OF BEEF. IV. CHARACTERISTICS OF DARK-CUTTING BEEF. SURVEY AND PRELIMINARY INVESTIGATION. Kans. Agr. Expt. Sta. Tech. Bul. 58.

(290) HARA, H.
1930. BIOCHEMICAL STUDIES ON SKIN, BONE AND SHELL. I. SEXUAL DIFFERENCE IN THE COMPOSITION OF BONE. Agr. Chem. Soc. Japan Jour. 6: 655-658. Also: Agr. Chem. Soc. Japan. Bul. 6: 35-6. C.A. 25: 994.

(291) --------
1931. BIOCHEMICAL STUDIES ON THE BONE. I. Agr. Chem. Soc. Japan. Jour. 7: 13-18. C.A. 25: 3042.

(292) HOPPE-SEYLER, G. and LANG, K.
1933. METHOD FOR DETERMINING CONNECTIVE TISSUE SUBSTANCE (COLLAGEN) IN ORGANS. Hoppe-Seylers Ztschr. Physiol. Chem. 215: 101-105. C.A. 27: 2108.

(293) -------- --------
1934. CHEMICAL COMPOSITION OF LIVER IN PATHOLOGIC CONDITIONS AND PARTICULARLY COLLAGEN CONTENT OF ITS CONNECTIVE TISSUE. Deut. Arch. f. klin. Med. 176: 663-668.

(294) KRAUSE, A. C.
1934. THE CHEMICAL COMPOSITION OF THE MUCOID AND COLLAGEN OF THE CHOROID AND IRIS. Arch. Oftalmol. Hispano-amer. 34: 297-303. C.A. 11: 1624 .

(276) WOLPERS, C.
1943. TRANSVERSELY STRIATED COLLAGEN FIBERS AND ELEMENTARY SUBSTANCE OF CONNECTIVE TISSUE; ELECTRON MICROSCOPIC STUDIES Klin. Wchnschr. 22: [illegible].

(277) --------
1944. ELECTRON MICROSCOPIC PREPARATION OF ELASTIC TISSUE ELEMENTS. Klin. Wchnschr. 23: 1[illegible]-17[illegible].

(278) --------
1944. TRANSVERSE STRIATION OF COLLAGENIC CONNECTIVE TISSUE FIBRILS. Virchows Arch. f. Path. Anat. 112: 288.

(279) WORSCHITZ, F.
1934. FINE STRUCTURE OF MYOFIBRILS AND COLLAGEN FIBERS; METAHISTOLOGIC STUDY OF ANIMAL FIBERS. Fortschr. a. d. Geb. d. Roentgenstrahlen 50: 1[illegible]-178.

(280) WYCKOFF, R. W. G. and COREY, R. B.
1936. X-RAY DIFFRACTION PATTERNS FROM REPRECIPITATED CONNECTIVE TISSUE. Soc. Expt. Biol. and Med. Proc. 34: 285-287. C.A. 31: [illegible]21.

SECTION III. CHEMISTRY

A. SOURCES AND DETERMINATION

(281) ALBURN, H. E. and MYERS, V. C.
1939. THE CREATINE, PHOSPHORUS AND COLLAGEN CONTENT OF DIFFERENT SECTIONS OF THE DOG HEART. Jour. Biol. Chem. 131: 713-716. C.A. [illegible]: [illegible].

(282) ALMQUIST, H. J.
1934. PROTEINS OF THE EGG SHELL. Poultry Sci. 13: 375. B.A. 9: 1[illegible]542.

(283) BELL, E. F., MORGAN, A. F., and DORMAN, A.
1941 COLLAGEN DETERMINATION IN COOKED MEAT. Food Res. 6: 245-2[illegible]. C.A. 35: [illegible].

(284) BLUMGART, H. L., GILLIGAN, D. R., and SCHLESINGER, M. J.
1940. THE DEGREE OF MYOCARDIAL FIBROSIS IN NORMAL AND PATHOLOGICAL HEARTS AS ESTIMATED CHEMICALLY BY THE COLLAGEN CONTENT. Assoc. Amer. Physicians Trans. 55: 313-318. C.A. 35: 5176.

(285) COVER, S., MACKEY, A. K., MURPHY, C. E., MILLER, J. C., BASS, H. T., BELL, C. L., and HAMALAINEN, C.
1944. EFFECTS OF FATNESS ON TENDERNESS OF LAMB. Tex. Agr. Expt. Stat. Bul. [illegible]61.

B. PREPARATION AND GENERAL CHEMICAL PROPERTIES

(305) BEEK, J., Jr.
1932. **RELATIVE TO THE STRUCTURE OF COLLAGEN.** U. S. Natl. Bur. Standards Jour. Res. 8: 549-553. C.A. 26: 5449.

(306) --------
1935. **COMBINING WEIGHT OF COLLAGEN.** U. S. Nat. Bur. Stand. Jour. Res. 14: 217-225. C.A. 29: 4204.

(307) --------
1941. **THE CARBOHYDRATES IN COLLAGEN.** Amer. Chem. Soc. Jour. 63: 1483.

(308) --------
1941. **THE CARBOHYDRATE CONTENT OF COLLAGEN.** U. S. Natl. Bur. Standards Jour. Res. 27: 507-517. (Also in Amer. Leather Chem. Assoc. Jour. 36: 696-710. 1941).

(309) BELL, D. J. and BALDWIN, E.
1940. **1-GALACTOSE AS A COMPONENT OF A POLYSACCHARIDE OF ANIMAL ORIGIN.** Nature, London, 146: 559-560.

(310) BERGMANN, M.
1934. **CHEMISTRY OF SKIN AND CATECHIN TANNIN.** Internatl. Soc. Leather Trades Chem. Jour. 18: 159-165. C.A. 28: 2937.

(311) -------- and STEIN, W. H.
1939. **A NEW PRINCIPLE FOR THE DETERMINATION OF AMINO ACIDS, AND ITS APPLICATION TO COLLAGEN AND GELATIN.** Jour. Biol. Chem. 128: 217-232.

(312) BOGUE, R. H.
1923. **CONDITIONS AFFECTING THE HYDROLYSIS OF COLLAGEN TO GELATIN.** Indus. and Engin. Chem. 15: 1154-1159.

(313) BRAYBROOKS, W. E.
1939. **CONSTITUTION OF COLLAGEN.** Internatl. Soc. Leather Trades Chem. Jour. 33: 73-76. C.A. 33: 3199.

(314) BUERGER, L. and GIES, W. J.
1902. **CHEMICAL CONSTITUENTS OF TENDON ACHILLES.** Amer. Jour. Physiol. 6: 219-231. Abstract in: Chem. Soc. Jour. 82(II) 1902; p. 95.

(295) -------- and CHAN, EUGENE
1933. THE CHEMICAL CONSTITUTION OF THE CONJUNCTIVA, CHOROID AND IRIS. Amer. Jour. Physiol. 103: 270-274. B.A. 8: 3344.

(296) KRYLOVA, N.
1939. NEW METHOD FOR DETERMINING COLLAGEN IN MEAT AND SAUSAGE. Myasnaya Ind. SSSR 10(6)28-32. (Abstract: Chimie & Industrie 42: 721) C.A. 34: 2943.

(297) LOWRY, O. H., GILLIGAN, D. R., and KATERSKY, E. M.
1941. DETERMINATION OF COLLAGEN AND ELASTIN IN TISSUES WITH RESULTS OBTAINED IN VARIOUS NORMAL TISSUES FROM DIFFERENT SPECIES. Jour. Biol. Chem. 139: 795-804. C.A. 35: 4793.

(298) MITCHELL, H. H., HAMILTON, T. S., and HAINES, W. T.
1928. SOME FACTORS AFFECTING CONNECTIVE TISSUE CONTENT OF BEEF MUSCLE. Jour. Nutr. 1: 165-178. C.A. 23: 913.

(299) --------, ZIMMERMAN, R. L., and HAMILTON, T. S.
1927. THE DETERMINATION OF THE AMOUNT OF CONNECTIVE TISSUE IN MEAT. Jour. Biol. Chem. 71: 379-387. B.A. 2: 9750.

(300) MORSE, W.
1932. CHEMISTRY OF THE INTEGUMENT. IV. COLLAGEN. Jour. Biol. Chem. 97, Scientific Proc. 26: XXX.

(301) SCHNEIDER, F.
1937. OBSERVATIONS ON SKIN PROTEINS. Collegium: 522-530. ALCA Jour. [illegible] (1938).

(302) SPENCER, H. C.
1937. MICRODETERMINATION OF COLLAGEN. Jour. Biol. Chem. 119: Scientific Proc. XXXI:XCII.

(303) --------, MORGULIS, S., and WILDER, V. M.
1937. A MICROMETHOD FOR THE DETERMINATION OF GELATIN AND A STUDY OF THE COLLAGEN CONTENT OF MUSCLES FROM NORMAL AND DYSTROPHIC RABBITS. Jour. Biol. Chem. 120: 257-266. C.A. 31: [illegible].

(304) THOMAS, B. H. and YODER, L.
1941. DEVELOPMENT OF A RAPID METHOD FOR THE QUANTITATIVE DETERMINATION OF COLLAGEN AND ELASTIN IN ANIMAL TISSUES. Iowa Agr. Expt. Sta. Report on Agricultural Research 1941, pt. 1, p. 101.

(346) SADIKOV, V. S.
1924. **NITROGEN DISTRIBUTION IN SOME FRACTIONS OF CATALYZED COLLAGEN.** Biochem. Ztschr. 150: 365-367. C.A. 19: 1869.

(347) --------
1926. **THE PROPERTIES OF HIDE AND TENDON COLLAGEN AND THEIR REACTIONS WITH ENZYMES.** Collegium: 512-518. C.A. 21: 669.

(348) --------
1926. **A NEW PRODUCT OF THE CATALYTIC DECOMPOSITION OF THE COLLAGEN OF TENDONS.** Russ. Phys.-Chem. Soc. 58: 775-778. C.A. 22: 2957.

(349) --------
1927. **PREPARATION OF PURE COLLAGEN AND ITS UTILIZATION FOR TANNINS IN TANNING MATERIALS.** State Inst. Applied Chem. (Moscow) Trans. No. 6: 64-81. C.A. 22: 2485.

(350) SCHNEIDER, F.
1940. **CHEMICAL COMPOSITION OF COLLAGEN.** Collegium: 97-105. C.A. 34: 7649. JALCA 36: 489.

(351) SMITH, E. C. BATE
1938. **ACCELERATION BY PHOSPHATE IONS OF THE CONVERSION OF COLLAGEN INTO GELATIN.** Soc. Chem. Ind. Jour. 57: 82-84. T. C.A. 32: 4821.

(352) TANDLER, R.
1931. **CONTRIBUTION TO THE KNOWLEDGE OF COLLAGEN.** Collegium: 642-647. C.A. 26: 3138.

(353) TERRASSE, G. L.
1920. **HIDE SUBSTANCE.** Amer. Leather Chem. Assoc. Jour. 15: 608-620.

C. AMINO ACID COMPOSITION AND DETERMINATION

(354) BASTIAN, A.
1937. **DETERMINATION OF PROLINE IN A GELATIN HYDROLYZATE. RESULTS.** Soc. de Chim. Biol. Bul. 19: 1298-1301. C.A. 32: 84.

(355) --------, ZERVAS, L., and SCHLEICH, H.
1933. **MODE OF COMBINATION OF PROLINE IN GELATIN AND COLLAGEN.** Collegium (No. 753) 6-9. C.A. 27: 4548.

(356) BEVERIDGE, J. M. R. and LUCAS, C. C.
1944. **AMINO ACIDS OF ISINGLASS.** Jour. Biol. Chem. 155: 547-556.

(336) KANAGY, J. R.
1947. THE CHEMISTRY OF COLLAGEN. U. S. Natl. Bur. Stand. Cir. 458. 20 pp.

(337) KELLER, R.
1935. CHEMICAL AND ELECTRICAL PROPERTIES OF CONNECTIVE TISSUE. Biochem. Ztschr. 278: 447-453. C.A. 29: 8091.

(338) KÜNTZEL, A.
1938. THE BASIC REACTIONS OF COLLAGEN. Magyar Timar 2: 1-7. C.A. 32: 3193.

(339) --------
1937. CONCERNING THE DENATURING OF COLLAGEN. Stiasny Festschrift: 191-231. JALCA 34: 270.

(340) -------- and BUCHEIMER, K.
1930. PREPARATION AND PROPERTIES OF RAW COLLAGEN. Collegium: 205-217. C.A. 24: 4054.

(341) MANNING, C. R. and GIES, W. J.
1906/07. COMPARATIVE DATA FOR THE ELEMENTARY COMPOSITION AND THE HEAT OF COMBUSTION OF COLLAGEN AND GELATIN. Soc. Expt. Biol. and Med. Proc. 4: 160.

(342) MCLAUGHLIN, G. D.
1921. ON CERTAIN CHARACTERISTICS OF FRESH STEER HIDE. Amer. Leather Chem. Assoc. Jour. 16: 295-309.

(343) MEUNIER, L. and CHAMBARD, P.
1925. PREPARATION OF HIDE POWDER FOR TANNIN ANALYSIS. Pt. I. Soc. Leather Trades Chem. Jour. 9: 23-26. B.C.A. 1925: B: 219.

(344) -------- and --------
1926. PREPARATION OF ISOELECTRIC COLLAGEN. APPLICATIONS. Rev. Gen. Colloides. 4: 161-165. C.A. 20: 3587.

(345) --------, --------, and JAMET, A.
1925. PREPARATION OF HIDE POWDER FOR ANALYSIS. Soc. Leather Trades Chem. Jour. 9: 200-207. Cuir Tech. 14: 178-182. C.A. 19: 2143. ALCA Jour. 20: 390.

(325) GAVRILOV, N. I. and STACHEYEVA, E.
1931. INVESTIGATIONS IN THE FIELD OF LEATHER CHEMISTRY. II. ISOLATION OF SOME DIOXOPIPERAZINES FROM SKIN COLLAGEN. Biochem. Ztschr. 238: 53-59. C.A. 25: 5791.

(326) GRASSMANN, W.
1936. COLLAGEN. Kolloid. Ztschr. 77: 205-209. C.A. 31: 6261.

(327) GRASSMANN, W.
1942. RAW HIDE AS A SCIENTIFIC AND ECONOMIC PROBLEM. Chem. Ber. Prüf. No. 015 (PB 52017) 697-728. C.A. 41: 4941.

(328) GRASSMANN, W. and RIEDERLE, K.
1936. CONSTITUTION OF GLUTOKYRIN. III. STUDIES ON COLLAGEN. Biochem. Ztschr. 284: 177-188. C.A. 30: 3449.

(329) -------- and SCHLEICH, H.
1935. COLLAGEN. II. CARBOHYDRATE CONTENT OF COLLAGEN. Biochem. Ztschr. 277: 320-328. C.A. 29: 4619.

(330) -------, JANICKI, J., KLENK, L., and SCHNEIDER, F.
1937. GLUCIDE CONTENT OF SKIN PROTEINS. V. STUDIES ON COLLAGEN. Biochem. Ztschr. 294: 95-100. C.A. 32: 1288.

(331) GUSTAVSON, K. H.
1926. A MAXIMUM REACTIVITY OF THE HIDE PROTEIN IN ITS ISOELECTRIC ZONE. Amer. Chem. Soc. Jour. 48: 2963-2971.

(332) FLORENCE, G. and LOISELEUR, J.
1934. COLLAGEN SUBSTANCE. I. PREPARATION AND PROPERTIES OF DIFFERENT COLLAGENS. Soc. de Chim. Biol. Bul. 16: 52-63. C.A. 28: 3420.

(333) HIGHBERGER, J. H.
1936. THE CHEMISTRY OF COLLAGEN. I. THE PREPARATION OF COLLAGEN FROM FRESH STEER HIDE. Amer. Leather Chem. Assoc. Jour. 31: 93-103. C.A. 30: 3272.

(334) HOFMEISTER, F.
1878. ON THE CHEMICAL STRUCTURE OF COLLAGENS. Ztschr. f. physiol. Chem. 2: 299-323.

(335) --------
1880. CHEMICAL STRUCTURE OF COLLAGEN. Biedermann's Zentbl. f. Agr. Chem. 772. Abstr. in Lond. Chem. Soc. Jour. A 294. 1881.

(315) CHAMBARD, P., MEUNIER, L. and SOUBIRAN
1941. THE GELATINIZATION OF COLLAGEN. Chim. & Indus. Paris 45, No. 3 bis: 58-60. C.A. 37: 2214. C.Z. 1942: I: 206-207.

(316) CHERBULIEZ, E. and MEYER, K. H.
1938. TRANSFORMATION OF COLLAGEN INTO COLLAGEN II AND INTO GELATIN. Carlsberg Lab. Compt. Rend. des Trav. Ser. Chim. 22: 118-124. C.A. 32: 6094.

(317) -------, JEANNERAT, J., and MEYER, K. H.
1937. COLLAGEN A, COLLAGEN B, AND GELATIN. Soc. Phys. His. Nat. Geneve Compt. Rend. 54: 122-123 (in Arch. Sci. Phys. Nat. 19, Suppl. 122, Nov.-Dec. 1937) C.A. 32: 8443.

(318) CHERNOV, N. V.
1942. CHANGES IN AMIDO N AS COLLAGEN IS CONVERTED INTO GELATIN. Legkaya Prom. 2, No. 5/6, 23-24. C.A. 38: 5429.

(319) DEFORGE, A.
1937. THE REACTIONS OF COLLAGEN. Halle Aux Cuirs (Suppl. Tech.) 1, 25, 49, 73, 121, 169, 217. JALCA 34: 59. 1939. C.Z. 1937: I: 2524, 4454, 5091. 1937 II: 1930. C.A. 32: 3657.

(320) --------
1940. INTRODUCTION TO THE STUDY OF THE CHEMICAL REACTIONS OF TANNAGE. Halle Aux Cuirs 2-6. C.A. 34: 3124.

(321) ELÖD, E. and SIEGMUND, W.
1934. PREPARATION AND PROPERTIES OF ISO-ELECTRIC COLLAGEN. Collegium 281-285. C.A. 28: 5710.

(322) EMMETT, A. D. and GIES, W. J.
1907. ON THE CHEMICAL RELATION OF COLLAGEN TO GELATIN. Amer. Soc. Biol. Chem. , Proc. Jour. Biol. Chem. 3: XXXIII-XXXIV, 1907. C.A. 1: 2261.

(323) FAURÉ-FREMIET, E.
1933. SOME PROPERTIES OF SOLUBLE COLLAGEN. Soc. de Biol. Paris Compt. Rend. 113: 715-717. C.A. 27: 4822.

(324) FISCHER, M.
1882. DECOMPOSITION OF COLLAGEN MATERIALS. Anzeiger der böhm. Naturf. vers. 61. May 1882. C.Z. 1882: 13: 796.

(367) MOORE, S. and STEIN, W. H.
1943. DETERMINATION OF AMINO ACIDS BY THE SOLUBILITY PRODUCT METHOD (LEUCINE AND GLYCINE). Jour. Biol. Chem. 150: 113-130. C.A. 38: 592.

(368) PATTEN, A. R.
1935. DETERMINATION OF GLYCINE IN PROTEINS. Jour. Biol. Chem. 108: 267-272.

(369) REES, M. W.
1946. ESTIMATION OF THREONINE AND SERINE IN PROTEINS. Biochem. Jour. 40: 632-640.

(370) RUTHERFORD, H. A., HARRIS, M. and SMITH, A. L.
1937. ESTIMATION OF AMINO NITROGEN IN INSOLUBLE PROTEINS. U. S. Natl. Bur. Stand. Jour. Res 19: 467-477.

(371) STEIN, W. H. and BERGMANN, M.
1940. DETERMINATION OF PROLINE IN MIXTURES CONTAINING I- AND DI PROLINE. Jour. Biol. Chem. 134: 627-633.

(372) TADOKORO, T.
1934. SEX DIFFERENCES FROM THE STANDPOINT OF BIOCHEMISTRY. III. Hokkaido Imp. Univ. Faculty Sci. Jour., Series III, 1, No. 2: 13-88. C.A. 29: 1865.

(373) THEIS, E. R. and JACOBY, T. F.
1941. STUDIES IN ANIMAL SKIN PROTEINS. II. THE EFFECT OF CALCIUM HYDROXIDE UPON THE BASIC AMINO-ACID CONTENT OF COLLAGEN. Amer. Leather Chem. Assoc. Jour. 36: 375-384. C.A. 35: 7753.

(374) TRISTRAM, G. R.
1946. OBSERVATIONS UPON THE APPLICATION OF PARTITION CHROMATOGRAPHY TO THE DETERMINATION OF THE MONOAMINO-ACIDS IN PROTEINS. Biochem. Jour. 40: 771-783.

(375) VAN SLYKE, D. D.
1912. THE QUANTITATIVE DETERMINATION OF ALIPHATIC AMINO GROUPS. II. Jour. Biol. Chem. 11: 375-384.

(376) --------, HILLER, A., and MACFADYEN, D. A.
1941. DETERMINATION OF HYDROXYLSINE IN PROTEINS. Jour. Biol. Chem. 141: 681-703.

(357) BLOCK, R. J. and BOLLING, D.
1945. **AMINO ACID COMPOSITION OF PROTEINS AND FOODS.** 396 pp. Springfield, Ill., Thomas.

(358) BOTVINIK, M. M. and NERSESOVA, E. N.
1946. **THE CONTENT OF HYDROXY AMINO ACIDS IN PROTEINS.** Acad. Sci. U.S.S.R. Compt. Rend. 52: 429-432. C.A. 41: 2452.

(359) CHIBNALL, A. C.
1946. **THE CONTRIBUTION OF THE ANALYTICAL CHEMIST TO THE PROBLEM OF PROTEIN STRUCTURE.** Internatl. Soc. Leather Trades Chem. Jour. 30: 1-20.

(360) GERNGROSS, O., VOSS, K., and HERFELD, H.
1933, **HIGHLY SENSITIVE, STRICTLY TYROSINE-SPECIFIC COLOR REACTION OF P-SUBSTITUTED PHENOLS. THE TYROSINE CONTENT OF DIFFERENT PROTEINS, ESPECIALLY OF COLLAGEN AND GELATINS.** Deut. Chem. Ges. Ber. 66 B: 435-442. 1933. C.A. 27: 3204.

(361) HARRIS, M. and KANAGY, J. R.
1935. **AMINO NITROGEN CONTENTS OF WOOL AND COLLAGEN.** Assoc. Textile Chem. Colorists. Proc. 1935: 124-129. Also in Amer. Dyestuff Rptr. 24: 182-187. 1935. C.A. **29:** .3845.

(362) HIGHBERGER, J. H.
1937. **BASIC AMINO ACIDS OF THE COLLAGEN OF FRESH STEER HIDES.** Stiasny Festschrift 134-141.

(363) HIGHBERGER, J. H.
1938. **THE CHEMISTRY OF COLLAGEN. III. THE BASIC AMINO ACIDS OF VARIOUS COLLAGEN PREPARATIONS.** Amer. Leather Chem. Assoc. Jour. 33: 9 15. C.A. 32: 3656.

(364) KANAGY, J. R. and HARRIS, M.
1935. **AMINO-NITROGEN CONTENT OF WOOL AND COLLAGEN.** U. S. Natl. Bur. Stand. Jour. Res. 14: 563-574. Also in Amer. Assoc. Textile Chem. Colorists. Proc. 1935: 124-129. C.A. 29: [illegible].

(365) MACPHERSON, H. T.
1946. **THE BASIC AMINO-ACID CONTENT OF PROTEINS.** Biochem. Jour. 40: 470-481.

(366) MARRIOTT, R. H.
1931. **ORIGIN OF AMMONIA FOUND IN LIME LIQUORS.** Internatl. Soc. Leather Trades Chem. Jour. 15: 25-30.

(386) CHAMBARD, P. and GARNOT, R.
1937. **SWELLING OF SKIN IN THE PRESENCE OF DIFFERENT SALT SOLUTIONS.** Internatl. Soc. Leather Trades Chem. Jour. 21: 138-149. C.A. 31: 4155.

(387) CHANG, P. C. and CHANG-TAI YEN
1945. **THE SWELLING OF COLLAGEN FIBER. I. THE SWELLING OF DEAMINATED COLLAGEN FIBER.** Chinese Chem. Soc. Jour. 12: 107-112. C.A. 40: 4237.

(388) DEFORGE, A.
1936. **THE ACTION OF ACIDS AND BASES ON THE SWELLING OF COLLAGEN.** Halle aux Cuirs 1, 25, 49, 73, 97. (Suppl. Tech.) JALCA 32: 337. 1937. C.A. 1936 I½ 3065. I: 4653. 1936 II: 415.

(389) ELÖD, E. and SCHACHOWSKOY, TH.
1941. **ACTION OF PALATINE FAST DYES ON COLLAGEN (MINERAL TANNING).** Kolloid. Ztschr. 94: 188-199. C.A. 35: 4239.

(390) FOKINA, N.
1937. **STUDY OF THE FINE STRUCTURE OF COLLAGEN FIBERS DURING THE PROCESS OF ALKALI SWELLING.** Colloid Jour. (USSR) 3: 425-431. C.A. 32: 6131.

(391) FOKINA, N. S.
1937. **STRUCTURAL CHANGES IN COLLAGEN FIBER ON LIMING WITH MIXTURES OF LIME AND SODIUM SULFIDE.** Colloid Jour. (USSR) 3: 737-744. C.A. 32: 6901.

(392) --------
1937. **EFFECT OF LIMING ON FINE STRUCTURE AND PHYSICOMECHANICAL PROPERTIES OF COLLAGEN FIBER.** Colloid Jour. (USSR) 3: 745-755. C.A. 32: 6902

(393) GAVRILOV, N. I., BOTWINIK, M. M., and MOSKOVA, I. S.
1934. **LEATHER CHEMISTRY. III. EFFECT OF POTASSIUM THIOCYANATE ON ELASTIN AND COLLAGEN.** Biochem. Ztschr. 272: 56-63. C.A. 28: 7061.

(394) GUSTAVSON, K. H.
1926. **A POSSIBLE EXPLANATION OF THE ANTAGONISTIC ACTION OF NEUTRAL SALTS ON HIDE SUBSTANCE.** Amer. Leather Chem. Assoc. Jour. 21: 206-216.

D. REACTIONS WITH ACIDS, ALKALIES, SALTS

(377) ATKIN, W. R.
1937. **ACTION OF NITROUS ACID ON COLLAGEN.** Stiasny Festschr: 13-20. Darmstadt. C.A. 32: 7765.

(378) BEEK, J., JR.
1938. **COMBINATION OF HYDROCHLORIC ACID AND SODIUM HYDROXIDE WITH HIDE, TENDON AND BONE COLLAGEN.** U. S. Natl. Bur. Stand. Jour. Res. 21: 117-124. (Also in: Amer. Leather Chem. Assoc. Jour. 33: 621 29 1938).

(379) BEZLER, F. I.
1936. **MICROSCOPIC OBSERVATIONS MADE DURING THE SWELLING OF COLLAGEN DURING LIMING. COLLECTED REPORTS ON EXTRACTS USED IN LEATHER INDUSTRY.** Appendix to Kozhevenno-Obuvnaya Prom. S.S.S.R. 15: no. 1: 45-50. C.A. 31: 5203.

(380) BLACKBURN, S. and PHILLIPS, H.
1944. **EXPERIMENTS ON THE METHYLATION AND ACETYLATION OF WOOL, SILK FIBROIN, COLLAGEN AND GELATIN.** Biochem. Jour. 38: 171-178.

(381) BRAVO, G. A. and BALDRACCO, F.
1931. **COMBINATION OF COLLAGEN WITH DYES.** R. Staz. Industria Pelli. Bol. 9: 356. ALCAJ 28: 45.

(382) -------- --------
1931. **COMBINATION OF COLLAGEN WITH DYESTUFFS.** Ann. di Chim. Appl. Rome 21: 355-365. C.A. 26: 870.

(383) -------- --------
1931. **COMBINATION OF COLLAGEN WITH DYESTUFFS.** Le Cuir Tech. 20: 437-440. C.A. 26: 1472.

(384) -------- --------
1932. **COMBINATION OF COLLAGEN WITH DYES. I.** Collegium (no. 744) 338-343. C.A. 26: 4501.

(385) -------- and BALDRACCO, F.
1933. **COMBINATION OF COLLAGEN WITH DYES. II.** Collegium (no. 764): 772-778. C.A. 28: 1566.

(404) KÜNTZEL, A.
1926. SWELLING OF COLLAGEN FIBERS IN ACIDS. I. MINERAL ACIDS Kolloid Ztschr. 40: 264-279. C.A. 21: 3059.

(405) --------
1927. THE SWELLING OF COLLAGEN FIBERS IN ACIDS. I. MINERAL ACIDS. Collegium: 25-45.

(406) --------
1927. THE SWELLING OF COLLAGEN THREADS. Gerber 53: 11. C.A. 21: 1369.

(407) --------
1930. THE ACTION OF PICKLES OF DIFFERENT COMPOSITIONS. I. ACID ABSORPTION AND SWELLING OF COLLAGEN IN HYDROCHLORIC ACID SODIUM CHLORIDE PICKLES. Collegium: 218-233. C.A. 24: 4654.

(408) --------
1939. CHEMICAL TECHNOLOGY OF COLLAGEN. Cuir Tech. 28: 106-110. C.A. 33: 7615.

(409) -------- and BIEDERMANN, R.
1931. REMOVAL OF LIME FROM ANIMAL SKIN BY ACIDS AND ACID SALTS. Kolloid Ztschr. 56: 207-225. C.A. 26: 1822. C.Z. 1931: 2975-58 says also in Collegium. 1931: 495-524.

(410) -------- and DOEHNER, K.
1939. DETERMINATION OF HEAT OF TRANSFORMATION OF COLLAGEN DURING "LIME-TREATMENT". Angew. Chem. 52: 175.

(411) -------- and LI, T. T.
1938. HYDROLYTIC ACTION OF ACIDS ON HIDE SUBSTANCE AND LEATHER. Collegium: 385-402. JALCA 33: 169.

(412) -------- and PHILIPS, V.
1932. ACTION OF PICKLES OF DIFFERENT COMPOSITIONS. III. THE ACTION OF NEUTRAL SALTS ON THE SWELLING AND DECOMPOSITION OF HIDE SUBSTANCE BY ALKALINE SOLUTIONS. Collegium: 267-284. C.A. 26: 3783.

(413) -------- and PHILIPS, J.
1933. ACTION OF ALKALI ON COLLAGEN. I. INVESTIGATION OF THE WATER-AND ALKALI SOLUBLE NON-COLLAGEN PROTEIN AND COLLAGEN DECOMPOSITION PRODUCTS. Collegium: 193-206. C.A. 27: 3850.

(395) --------
1926. THE SULFATO-HYDROXO-CHROMI-COLLAGEN COMPOUND. Amer. Leather Chem. Assoc. Jour. 21: 559-570. C.A. 21: 192.

(396) --------
1943. DONNAN EQUILIBRIA AND MOLECULAR EFFECTS IN PROTEIN SYSTEMS. THE PERMANENT DISORGANIZATION AND CHANGED REACTIVITY OF COLLAGEN PRE-TREATED IN ACID SOLUTIONS. Svensk Kem. Tidskr. 55: 191-200. C.A. 40: 2860.

(397) --------
1947. THE REACTION OF TETRA-OXALATO-DIOL-CHROMIATE WITH HIDE PROTEIN. Amer. Leather Chem. Assoc. Jour. 42: 201-208.

(398) GUYON, L.
1934. PHENOMENA OCCURRING IN SOLUTIONS OF COLLAGEN AT THE LIMITS OF ACTION OF ACIDS AND NEUTRAL SALTS. Acad. des Sci. Paris Compt. Rend. 198: 975-977. C.A. 28: 6162.

(399) HAUSAM, W.
1938. FURTHER INVESTIGATIONS ON THE BEHAVIOR OF HIDE DURING SALTING AND THE ACTION OF THE SALT ON THE HIDE PROTEIN. Collegium 625-629. C.Z. 1939. I: 2118. JALCA 35: 360. 1940.

(400) HIGHBERGER, J. H.
1936. THE CHEMISTRY OF COLLAGEN. II. TITRATION AND SWELLING CURVES IN HYDROCHLORIC ACID AND SODIUM HYDROXIDE OF THE COLLAGEN OF STEER HIDE. Amer. Leather Chem. Assoc. Jour. 31: 345-357. C.A. 30: 7905.

(401) -------- and STECKER, H. C.
1941. CHEMICAL ACTION OF SATURATED LIME SOLUTION ON COLLAGEN. Amer. Leather Chem. Assoc. Jour. 36: 368-374. C.A. 35: 7752.

(402) KERNOT, J. C. and KNAGGS, J. (Appendix by Madge Kaye)
1929. THE SWELLING OF FISH SKINS IN SOLUTIONS OF INORGANIC AND ORGANIC ACIDS. Appendix: Note on the Histology of fish skins. Roy. Soc. London. Proc. Ser. B. 105: 280-297. B.A. 4: 28984.

(403) KNAGGS, J.
1929. STUDIES ON COLLAGEN. THE CHANGES WHICH COLLAGEN UNDERGOES WHEN TREATED WITH SOLUTIONS OF HYDROCHLORIC ACID AND SODIUM HYDROXIDE. Biochem. Jour. 23: 1308-1327. C.A. 24: 2478.

(423) MCLAUGHLIN, G. D. and ADAMS, R. S.
1940. **ACID-BINDING POWER OF COLLAGEN.** Amer. Leather Chem. Assoc. Jour. 35: 44-50. C.A. 34: 2631.

(424) MEUNIER, L. and SCHWEIKERT, E.
1935. **ACTION OF NITROUS ACID ON COLLAGEN. PROPERTIES OF DEAMINIZED COLLAGEN.** Internatl. Soc. Leather Trades Chem. Jour. 19: 350-364. Also in: Le Cuir Tech. 24: 214-217; 231-236. 1935. C.A. 29: 6792.

(425) MOSKOVA, YU. S.
1936. **EFFECT OF VARIOUS FACTORS ENCOUNTERED IN LIMING ON THE PHYSICAL AND CHEMICAL PROPERTIES OF THE COLLAGEN TISSUE.** Tsentral. Nauch-Issledovatel. Inst. Kozhevennoi Prom., Sbornik Rabot no. 9: 36-55. C.A. 31: 3324.

(426) PAVLOV, S. A.
1938. **MECHANISM OF THE ACTION OF SALTS ON COLLAGEN.** Jour. Gen. Chem. USSR 8: 456-459 (in French: 459). C.A. 32: 7327.

(426a) ROGERS, J. S.
1922. **THE PLUMPING OF HIDE POWDER OF LACTIC AND ACETIC ACID.** Amer. Leather Chem. Assoc. Jour. 17. 611-622.

(427) SADIKOV, V. S.
1910. **THE REACTIONS BETWEEN COLLAGEN AND CARBON DISULPHIDE.** Kolloid chem. Beihefte 1: 119-120. C.A. 4: 3244.

(428) SMORODINTSEV, I. A. and PAVLOV, S. A.
1937. **ACTION OF ALKALI METALS ON COLLAGEN.** Acad. des Sci. U.R.S.S. Compt. Rend. (DOK) 15. 217-220. C.A. 32: 2549. JALCA 34: 116.

(429) SOKOLOV, S. I. and FEL'DMAN, R. I.
1943. **DISPLACEMENT OF ISOELECTRIC POINT AND STRUCTURAL CHANGES INDUCED IN COLLAGEN AND GELATIN BY TREATMENT WITH ALKALI.** Legkaya Prom. [illegible]: 19-20. C.A. 38: 1661.

(430) THOMAS, A. W. and FOSTER, S. B.
1925. **THE DESTRUCTIVE AND PRESERVATIVE EFFECT OF NEUTRAL SALTS ON HIDE SUBSTANCES.** Ind. Eng. Chem. 17: 1162-1164.

(431) -------- --------
1926. **BEHAVIOR OF DEAMINIZED COLLAGEN.** Amer. Chem. Soc. Jour. 48. 489-501. C.A. 20: 1118.

(414) -------- --------
1933. ACTION OF ALKALI ON COLLAGEN. II. RELATION BETWEEN THE SOLUBILITY IN ALKALI OF THE NON-COLLAGEN PROTEIN OF COLLAGEN AND THE KIND AND CONCENTRATION OF ALKALI SOLUTION AND THE NATURE OF THE COLLAGEN. Collegium: 207-212. C.A. 27: 3850.

(415) -------- --------
1933. ACTION OF ALKALI ON COLLAGEN. III. EFFECT OF TREATMENT WITH ALKALI ON THE INSOLUBLE COLLAGEN RESIDUE. Collegium: 213-229. C.A. 27: 3850.

(416) -------- and PREISENTANZ, W.
1930. THE ACTION OF PICKLES OF DIFFERENT COMPOSITIONS. II. ACID ABSORPTION AND SWELLING OF COLLAGEN IN SULFURIC ACID AND FORMIC ACID PICKLES. Collegium: 577-593. C.A. 25: 2327.

(417) -------- and SCHWANK, M.
1940. CHEMISTRY OF THE SYNTHETIC TANNINS. III. THE COMBINATION OF PHENOL AND OF PHENOLNOVOLAC WITH COLLAGEN. Collegium: 489-499. C.A. 35: 3477.

(418) LEPLAT, G.
1933. PARTIAL SOLUTION, IN VARIOUS ACID MEDIA, OF A COLLAGEN SUBSTANCE FROM VARIOUS TENDONS OTHER THAN THOSE OF THE RAT. Soc. de Biol. Paris Compt. Rend. 112: 1256-1257. C.A. 27: 3228.

(419) LLOYD, D. J. and MARRIOTT, R. H.
1935. SWELLING OF STRUCTURAL PROTEINS: THE INFLUENCE OF THE RETICULAR TISSUE ON THE SWELLING OF COLLAGEN IN WATER AND HYDROCHLORIC ACID. Roy. Soc. London Proc. Ser. B. 118: 439-448. C.A. 30: 1073.

(420) -------- and STOCKALL, G.
1937. SWELLING OF STRUCTURAL PROTEINS. INFLUENCE OF RETICULAR TISSUE ON SWELLING OF COLLAGEN IN ALKALINE SOLUTIONS. Stiasny Festschr. 232-239. C.A. 32: 7929.

(421) LOTTERMOSER, A. and TACHECI, T.
1931. STUDIES ON SWELLING. II. ACTION OF ACIDS ON HIDE POWDER. Kolloid Ztschr. 57: 66-68. C.A. 26: 870.

(422) MCLAUGHLIN, G. D.
1920. SWELLING OF LIMED AND HYDRATED HIDE IN THE PRESENCE OF ACID OR ALKALI. Amer. Leather Chem. Assoc. Jour. 15: 228-234.

(441) FORBES, J. C.
1927. PURIFICATION OF PEPSIN, ITS PROPERTIES AND PHYSICAL CHARACTERS. Jour. Biol. Chem. 71: 559-585. (Pepsin attacks collagens).

(442) GAVRILOW, N. I., and SIMSKAYA, A.
1931. INVESTIGATIONS IN THE FIELD OF LEATHER CHEMISTRY. I. THE SHIFTING OF THE ISOELECTRIC POINT OF COLLAGEN FOLLOWING THE ACTION OF TRYPSIN. Biochem. Ztschr. 238: 44-52. C.A. 25: 5791.

(443) -------- --------
1931. CHANGE IN THE ISOELECTRIC POINT OF COLLAGEN UNDER THE ACTION OF TRYPSIN. Ovladenie Tekhnikoi: Kozhevennoe Proizvodstvo no. 2: 23-24. C.A. 28: 394.

(444) GÉNIN, G.
1930. THE INFLUENCE OF TRYPSIN ON THE QUALITY OF COLLAGEN. Halle aux cuirs (Suppl. Tech.) 1930: 208-209. C.Z. 1930 II: 1937.

(445) GRASSMAN, W.
1934. PROGRESS IN THE FIELD OF PROTEOLYTIC ENZYMES. Collegium 549-563. JALCA 30: 325. C.Z. 1935 I: 734.

(446) --------, JANICKI, J. and SCHNEIDER, F.
1937. ACTION OF TRYPSIN ON COLLAGEN. Kuiesny Festschr. 74-87. JALCA 34: 113 (1939). C.A. 32: 7765.

(447) HOBSON, R. P.
1931. AN ENZYME FROM BLOW-FLY LARVAE *(LUCILIA SERICATA)* WHICH DIGESTS COLLAGEN IN ALKALINE SOLUTION. Biochem. Jour. 25: 1458-1463. C.A. 26: 1984.

(448) JENNISON, M. W.
1945. BACTERIAL COLLAGENASE. Jour. Bact. 50: 369-370. C.A. 40: 920. B.A. 20: 5355.

(449) JOHNSTON, W. W.
1937. SOME CHARACTERISTICS OF THE ENZYMES OF THE PYLORIC CECA OF COD AND HADDOCK. (APPLICATION TO LEATHER BATING). Canada. Biol. Board. Jour. 3: 477-495. C.A. 32: 3489.

(450) JOVANOVITS, J. A.
1932. SWELLING OF COLLAGEN FIBERS. DETERMINATION OF THE VALUE OF BATES. Collegium 761-771. C.A. 27: 1782.

(432) -------- and KELLY, M. W.
1927. THE DESTRUCTIVE AND PRESERVATIVE EFFECTS OF NEUTRAL SALTS ON HIDE SUBSTANCES. II. Ind. Engin. Chem. 19: 477-480.

E. REACTIONS WITH ENZYMES

(433) ACKERMANN, W.
1930. THE ACTION OF PAPAYOTIN AND PAPAIN ON HIDE POWDER. Collegium: 74-79. Abstract in: Internatl. Soc. Leather Trades Chem. Jour. 1930. 14: 677.

(434) BARES, J.
1927. THE INFLUENCE OF PROTEOLYTIC ENZYMES FOUND IN MUSHROOMS ON THE DIGESTION OF NITROGENOUS SUBSTANCES. Chem. Listy 21: 202-209. C.A. 22: 254 (amino index of the exts. for Witte's peptone collagen).

(435) BERGMANN, M. and POJARLIEFF, G.
1934. TRYPTIC DIGESTION OF COLLAGEN. Biochem. Ztschr. 269: 77-79. C.A. 28: 4084.

(436) -------- -------- and THIELE, H.
1933. THE ACTION OF PANCREATIN ON GELATIN AND COLLAGEN. Collegium 581-585. a review. C.A. 28 2567.

(437) DeFORGE, A.
1933. BATING. Halle des Cuirs Suppl. Tech.) 152, 173, 197, 217. JALCA 29: 219. 1934.

(438) --------
1938. CONSIDERATIONS ON BATING. Halle aux Cuirs 25-9, 49-53. C.A.

(439) FENGER, F., ANDREW, R. H., and RALSTON, A. W.
1928. ON THE ISOELECTRIC PRECIPITATION OF PEPSIN. II Jour. Biol. Chem. 80: 187-190.

(440) FOKINA, N. S.
1937. BATING OF COLLAGEN FIBERS FROM HIDES. Colloid Jour. USSR 3: 757-765. C.A. 32: 6903.

(460) --------
1932. **ACTION OF TRYPSIN ON COLLAGEN.** Internatl. Soc. Leather Trades Chem. Jour. 16: 6-16. C.A. 26: 1823.

(461) MASCHMANN, E.
1938. **BACTERIAL PROTEASES. IX. THE ANAEROBIASE OF THE GAS GANGRENE ORGANISM.** Biochem. Ztschr. 297: 284-296. C.A. 32: 9151.

(462) McCLEAN, D. and HALE, C. W.
1941. **STUDIES ON DIFFUSING FACTORS. THE HYALURONIDASE ACTIVITY OF TESTICULAR EXTRACTS, BACTERIAL CULTURE FILTRATES AND OTHER AGENTS THAT INCREASE TISSUE PERMEABILITY.** Biochem. Jour. 35: 159-183.

(463) MERRILL, H. B.
1927. **EFFECT OF TEMPERATURE ON BATING.** Indus. Engin. Chem. 19: 382-385. C.A. 21: 1565.

(464) -------- and FLEMING, J. W.
1927. **ACTION OF TRYPSIN ON CALFSKIN.** Amer. Leather Chem. Assoc. Jour. 22: 139-161. C.A. 21: 1369.

(465) -------- --------
1927. **ACTION OF TRYPSIN ON UNLIMED SKIN.** Amer. Leather Chem. Assoc. Jour. 22: 274-278.

(466) MOELLER, W.
1921-22. **NATURE OF LIMING AND BATING.** Ztschr. Leder u. Gerberei-Chem. 1: 252-2[illegible]; 1[illegible]-297; 3[illegible]-329; 335-339. C.A. 17: 2520.

(467) MOSKOVA, YU. S.
1937. **ACTION OF PANCREATIN ON THE COLLAGEN OF RAW HIDES.** Kozhevenno-Obuvnaya Prom. S.S.S.R. 16, no. 1: 41-45. C.A. 31: 5[illegible].

(468) --------
1940 **ACTION OF PANCREATIN ON THE COLLAGEN OF THE RAW SKIN.** Tsentral. Nauch.-Issledovatel. Inst. Kozhevenno-Obuvnoi Prom. Sbornik Rabot no. 11: 142-158. C.A. 35: 5341.

(469) NAUEN, F.
1931. **ON A RELATION BETWEEN THE SWELLING AND PROTEOLYSIS OF COLLAGEN.** Collegium: 151-154. Also in: Biochem. Ztschr. 231: 441-445. 1931. JALCA 26: 502.

(451) KOWALEWSKI, J. F.
1940. MICROBIOLOGICAL STUDY OF ANIMAL SKIN. II. ACTION OF PROTEOLYTIC BACTERIA ON COLLAGEN AND ELASTIN. Amer. Leather Chem. Assoc. Jour. 35: 656-663. C.A. 35: 342.

(452) KÜNTZEL, A. and DIETSCHE, O.
1931. INFLUENCE OF PANCREATIN ON COLLAGEN IN THE ABSENCE OF NEUTRAL SALTS AND BUFFER MIXTURES. Biochem. Ztschr. 231: 423-434. C.A. 25: 2161.

(453) -------- --------
1931. INFLUENCE OF PANCREATIN ON COLLAGEN IN THE ABSENCE OF NEUTRAL SALTS AND BUFFER MIXTURES. II. Biochem. Ztschr. 231: 435-440. C.A. 25: 2162. Also in Collegium 1931: 146-150.

(454) -------- --------
1931. ACTION OF PANCREATIN ON COLLAGEN IN THE PRESENCE OF LIME AND AMMONIUM SULFATE. Collegium: 155-162. C.A. 25: 5055.

(455) -------- and POTOTSCHNIG, B.
1932. THE CHARACTER OF BATING ACTION. I. INVESTIGATIONS OF A PHYSIOCHEMICAL CHANGE OF COLLAGEN BY PROTEOLYTIC ENZYMES. Collegium: 480-493. II. THE RELATIONS BETWEEN FERMENTATIVE BATES AND THE OTHER PRETANNING OPERATIONS. Collegium 559-571. III. THE THEORY OF BATING ACTION. Collegium: 571-580. C.A. 26: 6177.

(456) --------, MARQUARDT, G. and ENGEL, O.
1934. USE OF SHRUNKEN COLLAGEN AS SUBSTRATE FOR DETERMINING BATING VALUE. Collegium: 330-338. C.A. 28: 7066.

(457) LLOYD, D. J. and ROBERTSON, M. E.
1934. STRUCTURE OF COLLAGEN FIBERS AND THE POINT OF ATTACK BY PROTEOLYTIC ENZYMES. Nature 133: 102-103. C.A. 28: 2213.

(458) MARRIOTT, R. H.
1923. NOTE ON THE HYDROLYSIS OF COLLAGEN BY TRYPSIN. Soc. Leather Trades Chem. Jour. 7: 547-551. C.A. 18: 765. Polemical: criticism of work of Seymour-Jones. C.A. 17: 3427.

(459) --------
1926. A CRITICAL EXAMINATION OF NEW AND OLD THEORIES OF BATING PROCESS. Internatl. Soc. Leather Trades Chem. Jour. 10: 132-142. C.A. 20: 2761.

(480) --------
1924. HYDROLYSIS OF COLLAGEN BY TRYPSIN. Soc. Leather Trades Chem. Jour. 8: 226-229. C.A. 18: 2085. A reply to Marriott CA 18: 765.

(481) SIZER, I. W.
1945. EFFECTS OF TEMPERATURE ON THE DIGESTION OF COLLAGEN SUTURES AND SURGICAL GUT (CATGUT) BY ENZYMES AND BY THE SUBCUTANEOUS TISSUES OF THE FROG. Ann. Surg. 121: 231-238. C.A. 39: 2298.

(482) SMORODINTZEV, I. A. and ADOVA, A. N.
1933. NATURE OF PROTEASES. XII. CHANGE IN VISCOSITY OF SOLUTIONS OF MUSCLE PROTEIN AND COLLAGEN DURING PEPTIC DIGESTION. Fermentforschug 13: 563-572. C.A. 27: 2969.

(483) -------- --------
1933. EFFECT OF PEPSIN PREPARATIONS OF VARYING ACTIVITIES ON MUSCLE GLOBULINS AND COLLAGEN. Jour. Biochem. 18: 325-332. C.A. 28: 794.

(484) -------- --------
1935. ACTION OF PEPSIN ON MUSCULAR COLLAGEN AND GLOBULIN. Acad. de Med. Paris Bul. 114: 203-207. C.A. 30: 8258.

(485) STATHER, F. and MACHON, H.
1931. INFLUENCE OF TEMPERATURE ON THE DECOMPOSITION OF COLLAGEN BY PANCREATIN. Biochem. Ztschr. 239: 430-438. C.A. 26: 160.

(486) STAKHEEVA-KAVERZNEVA, E. D. and OLEFNIKOVA, E. I.
1936. FISSION OF ANIMAL PROTEINS BY THE PROTEASES OF ASPERGILUS ORYZAE. Biokhimiya 1: 331-341. (In German: 342) C.A. 31: 7448).

(487) STEFANOVICH, I. P.
1936. TECHNIQUE OF MEASURING PEPTIZATION PROCESSES IN PROTEOLYSIS. Biokhimiya 1: 698-704. C.A. 32: 8848.

(488) STIASNY, E. and ACKERMANN, W.
1923. ACTION OF TRYPSIN ON COLLAGEN AND THE INFLUENCE OF NEUTRAL SALTS UPON THIS ACTION. Kollegium: 33-43: 71-93. C.A. 17: 2518. Also in: Kolloidchem. Beihefte v. 17: 219-255. C.Z. 1923 IV: 430.

(470) NIEDERCORN, J. G., THAYER, F. D., JR. and EVANS, D. E.
19[illegible]. A CRITICAL EXAMINATION OF THE LOEHLEIN-VOLHARD METHOD FOR THE DETERMINATION OF THE PROTEOLYTIC ACTIVITY OF ENZYMES. Amer. Leather Chem. Assoc. Jour. 39: 342-362. C.A. 38: 6592.

(471) NORTHROP, J. H.
1930. CRYSTALLINE PEPSIN. I. ISOLATION AND TEST OF PURITY. Jour. Gen. Physiol. 13: 739-766. C.A. 24: 5318.

(472) --------
1930. CRYSTALLINE PEPSIN. II. GENERAL PROPERTIES AND EXPERIMENTAL METHODS. Jour. Gen. Physiol. 13: 767-780. C.A. 24: 5319.

(473) --------
1931. CRYSTALLINE PEPSIN. III. PREPARATION OF ACTIVE CRYSTALLINE PEPSIN FROM INACTIVE DENATURED PEPSIN. Jour. Gen. Physiol. 14: 713-724.

(474) OAKLEY, C. L., WARRACK, G. H., and HEYMINGER, W. E. VAN
1946. THE COLLAGINASE (K TOXIN) OF CLOSTRIDIUM WELCHII TYPE A. Jour. Path. and Bact. 58: 229-235. C.A. 40: 6556.

(475) PAGE, R. O. and PAGE, A. W.
1930. ACTION OF TRYPSIN ON THE PROPERTIES OF COLLAGEN. Indus. Engin. Chem. 22: 545-547.

(476) SADIKOV, V. S.
1927. A COLLAGEN-DISSOLVING ENZYME (COLLAGENASE). Biochem. Ztschr. 181: 167-288. C.A. 21: 2141.

(477) --------
1927. DIFFERENCE OF RESISTANCE OF TREATED AND UNTREATED COLLAGEN TO ENZYMES. State Inst. Applied Chem. (Moscow) Trans. no. 6: 6[illegible]-[illegible]8. C.A. 22: 2485.

(478) SEYMOUR-JONES, F. L.
1923. HYDROLYSIS OF COLLAGEN BY TRYPSIN. Soc. Leather Trades Chem. Jour. 7: 298-304. C.A. 17: 3427.

(479) --------
192[illegible]. HYDROLYSIS OF COLLAGEN BY TRYPSIN. Soc. Leather Trades Chem. Jour. 8: 70-77. C.A. 18: 1402.

(498) -------- --------
1939. FORMALDEHYDE TANNING. IV. INFLUENCE OF TIME ON THE COMBINATION OF FORMALDEHYDE WITH COLLAGEN AND KERATIN (HAIR). Internatl. Soc. Leather Trades Chem. Jour. 23: 499-502. C.A. 33: 9705.

(499) COBB, R. M. and HUNT, F. S.
1926. CHROME TANNING AT THE ISOELECTRIC POINT OF COLLAGEN - WITH DISCUSSION. Amer. Leather Assoc. Jour. 21: 454-464. C.A. 20: 3359.

(500) DULITSKAYA, R. A.
1935. STABILITY OF COMPOUNDS OF COLLAGEN WITH CHROMATES AND IRON SALTS. Tsentral. Nauch.-Issledovatel. Inst. Kozhevennoi Prom. Sbornik Rabot No. 8: 74-86. C.A. 31: 2838.

(501) EWALD, A.
1919. COLLAGEN II. ACTION OF FORMALDEHYDE ON COLLAGEN FIBRILS AND A NEW HISTOLOGICAL REACTION FOR COLLAGEN. Hoppe-Seylers Ztschr. f. Physiol. Chem. 105: [illegible] C.A. 14: 950.

(502) GUSTAVSON, K. H.
1926. AN INTERNAL COMPLEX SALT FORMATION AS THE MECHANISM OF CHROME TANNING. Amer. Leather Chem. Assoc. Jour. 21: 22-30. C.A. 20: 676.

(503) --------
1927. RESEARCHES ON THE MECHANISM OF TANNING. II. WHY DOES INACTIVATION OR REMOVAL OF BASIC PROTEIN GROUPS (FROM COLLAGEN) DECREASE THE FIXATION OF CATIONIC CHROME? Amer. Leather Chem. Assoc. Jour. 22: [illegible] C.A. [illegible].

(504) --------
1927. BEHAVIOR OF FORMALDEHYDE-TANNED HIDE POWDER TOWARD CHROMIUM COMPOUNDS. Indus. Engin. Chem. 19: 246-248.

(505) --------
1927. THE NEUTRAL SALT EFFECT IN CHROME TANNING. I. ACTION OF NEUTRAL CHLORIDES UPON THE TANNING PROPERTY OF CHROMIC CHLORIDES. Indus. Engin. Chem. [illegible]

(506) --------
1937. EXPLANATION OF THE FIXATION OF CHROMIUM SALTS BY HIDE SUBSTANCE AS THE FORMATION OF INNER COMPLEX SALTS. Strasny Festschr. 99-133. C.A. [illegible]

(507) --------
1940. TANNING POWER OF ALDEHYDES. Internatl. Soc. Leather Trades Chem. Jour. 24: 377-389. C.A. [illegible]

(489) THOMAS, A. W. and SEYMOUR-JONES, F. L.
1923. HYDROLYSIS OF COLLAGEN BY TRYPSIN. Amer. Chem. Soc. Jour. 45: 1813-1822.

(490) TRACY, G. and GIES, W. J.
1912. STUDIES OF ENZYMES II. INFLUENCE OF PROTEASES ON SWELLING OF FIBRIN, COLLAGEN AND ELASTIN PARTICLES IN ALKALINE AND ACID MEDIA. Biochem. Bul. 1: 467-474. C.A. 6: 2437.

(491) WILSON, J. A. and MERRILL, H. B.
1926. METHODS FOR MEASURING THE ENZYME ACTIVITIES OF BATING MATERIALS. Amer. Leather Chem. Assoc. Jour. 21: 2-18.

(492) -------- --------
1926. ACTIVITIES OF PANCREATIC ENZYMES USED IN BATING UPON DIFFERENT SUBSTRATES. Amer. Leather Chem. Assoc. Jour. 21: 50-53.

(493) WOLFF, R. and LAFRANCAISE
1933. THE INFLUENCE OF PANCREAS EXTRACT ON GLYCOCOLL DISSOLVED IN GLYCEROL. Acad. des Sci. Paris Compt. Rend. 196: 221-223. C.A. 1933 1: 1958

F. REACTIONS WITH TANNING AGENTS

(494) BLOCKEY. J. R., SPIERS, C. H., and FLORIN, O.
1941. COMPARATIVE ABSORPTION OF VEGETABLE TANNING MATERIALS FROM MIXTURES Internatl. Soc. Leather Trades Chem. Jour. 25: 1-11. C.A. 35: 1239.

(495) BOWES, J. H. and PLEASS, W. B.
1939. FORMALDEHYDE TANNING I. THE COMBINATION OF FORMALDEHYDE WITH COLLAGEN, KERATIN (HAIR) AND SILK FIBROIN. Internatl. Soc. Leather Trades Chem. Jour. 23: 365-385. C.A. 33: 9704.

(496) -------- --------
1939. FORMALDEHYDE TANNING II. COMBINATION OF FORMALDEHYDE WITH COLLAGEN AND KERATIN (HAIR) IN THE PRESENCE OF LIME. Internatl. Soc. Leather Trades Chem. Jour. 23: 451-453. C.A. 33: 9705

(497) -------- --------
1939. FORMALDEHYDE TANNING. III. THE COMBINATION OF FORMALDEHYDE WITH DEAMINATED COLLAGEN AND KERATIN. Internatl. Soc. Leather Trades Chem. Jour. 23: 453-460. C.A. 33: 9705.

(518) --------
1940. INFLUENCE OF ORGANIC COMPOUNDS IN CHROME TANNING. III. CALF-SKIN TANNAGES WITH THIRTY-THREE PER CENT BASIC SULFATE LIQUOR CONTAINING ORGANIC SALTS. HIDE POWDER SOLUBILITY IN ORGANIC SALT SOLUTIONS. PRECIPITATE AND GEL FORMATION IN CHROME LIQUORS CONTAINING ORGANIC SALTS. Internatl. Soc. Leather Trades Chem. Jour. 24: 199-205. C.A. 34: 6121.

(519) KOSTENKO, A. S. and SHIMANOVICH, S. B.
1939. INTERACTION OF IRON AND CHROMIUM SALTS WITH COLLAGEN IN THE COMBINED CHROME-IRON TANNING. Tzentral. Nauch.-Issledovatel. Inst. Kozhevennoi Prom., Sbornik Rabot no. 2: 67-76. C.A. 38: 7383.

(520) KÜNTZEL, A. and RIESS, C.
1936. CONTRIBUTIONS TO THE THEORY OF CHROME TANNING. VII. THE ORIGIN OF THE STABILITY TO BOILING OF CHROME TANNED LEATHER. Collegium: 635-646. JALCA 32: 409.

(521) -------- --------
1936. CONTRIBUTIONS TO THE THEORY OF MINERAL TANNING. THE THEORY OF CHROME TANNING. VIII. Collegium: 640-667. JALCA 32: 531.

(522) KUTYANIN, G. I. and ARBUZOV, G. A.
1946. THE BINDING OF SULFITE CELLULOSE (LIGNOSULFONATE) EXTRACT TANNIN BY COLLAGEN. Legkaya Prom. 1946. no. 11/12, 40-42. C.A. 41: 5330.

(523) McLAUGHLIN, G. C. and CAMERON, D. H.
1937. REVERSIBILITY OF BASIC CHROME SULFATE TANNAGE. Stiasny Festschrift: 240-244. C.A. 32: 7764.

(524) -------- -------- and ADAMS, R. S.
1939. NATURE OF THE REACTION BETWEEN HIDE SUBSTANCE AND BASIC CHROME SOLUTIONS. Amer. Leather Chem. Assoc. Jour. 29: 657-673.

(525) -------- -------- --------
1938. FURTHER STUDIES OF THE REVERSIBILITY OF BASIC CHROME SULFATE TANNING. Amer. Leather Chem. Assoc. Jour. 33: 418-422.

(526) MEUNIER, L. and QUEROIX, M.
1925. REACTIONS OF COLLAGEN IN SOLUTIONS OF QUINONE. Soc. Leather Trades Chem. Jour. 9: 26-31. C.A. 19: 2423.

(527) PAGE, R. O. and HOLLAND, H. C.
1937. NATURE OF THE COMBINATION OF WATTLE BARK TANNIN WITH COLLAGEN. II. Amer. Leather Chem. Assoc. Jour. 32: 78-85.

(508) --------
1940. THE HYDROTHERMAL STABILITY OF CORIUM PROTEINS IN COMBINATION WITH CHROMIC SALTS. Svensk Kem. Tidskr. 52: 75-97. C.A. 34: 5472.

(509) --------
1943. NATURE OF THE FORMALDEHYDE COMPOUNDS OF PROTEINS. Kolloid-Ztschr. 103: 45-51. C.A. 38: 1417.

(510) --------
1943. REACTION OF LIGNOSULFONIC ACID WITH HIDE SUBSTANCE. Tek. Tid. Uppl. C. Kemi. 73: 59-64. C.A. 38: 5427.

(511) --------
1944. INVESTIGATIONS OF THE REACTION BETWEEN LIGNOSULFONIC ACID COMPOUNDS AND HIDE PROTEIN. 82 p. (Stockholm. Ingeniörsvetenskapsakademiens. Handlingar nr. 177).

(512) HALLBERG, J.
1930. CHANGES OF CONSTITUTION OF CHROMIUM AQUO SALTS, AND THEIR REACTIONS WITH COLLAGEN. Tek. Tid. 60, Kemi 1-5. C.A. 25: 4143.

(513) HIGHBERGER, J. H. and O'FLAHERTY, F.
1939. FORMALDEHYDE TANNAGE IN RELATION TO THE STRUCTURE OF COLLAGEN. Internatl. Soc. Leather Trades Chem. Jour. 23: 549-556. C.A. 34: 2202.

(514) -------- and RETZSCH, C. E.
1939. COMBINATION OF FORMALDEHYDE WITH COLLAGEN. Amer. Leather Chem Assoc. Jour. 34: 31-48. C.A. 33: 5199.

(515) -------- and SALCEDO, I. S.
1940. A FURTHER STUDY OF THE COLLAGEN-FORMALDEHYDE REACTION. Amer Leather Chem. Assoc. Jour. 35: 11-24. C.A. 34: 2202.

(516) HOLLAND, H. C.
1939. AN INVESTIGATION OF THE COMBINATION OF COLLAGEN AND FORMALDEHYDE. Internatl. Soc. Leather Trades Chem. Jour. 23: 215-222. C.A. 33: 9039.

(517) --------
1940. INFLUENCE OF ORGANIC COMPOUNDS IN CHROME TANNING. II. HIDE-POWDER TANNAGES WITH THIRTY-THREE PER CENT BASIC SULFATE LIQUORS CONTAINING ADDITIONS OF SALTS OF ORGANIC ACIDS. Internatl. Soc. Leather Trades Chemists 24: 152-166. C.A. 34. 6120.

(538) -------- and GANZ, J.
1939. STUDIES IN CHROME TANNING. VI. THE EFFECT OF SODIUM CHLORIDE AND SODIUM SULFATE UPON BASIC CHROMIUM CHLORIDE TANNAGE. Amer. Leather Chem. Assoc. Jour. 34: 250-257.

(539) -------- and OTTENS, E. F.
1940. STUDIES IN ALDEHYDE TANNAGE. III. THE FREE AMINO GROUPS OF COLLAGEN BEFORE AND AFTER FORMALDEHYDE TREATMENT. Amer. Leather Chem. Assoc. Jour. 35: 330-351. C.A. 34: 4297.

(540) THOMAS, A. W. and KELLY, M. W.
1922. STUDIES IN CHROME TANNING. EQUILIBRIA BETWEEN TETRACHROME COLLAGEN AND CHROME LIQUORS. THE FORMATION OF OCTRACHROME COLLAGEN. Indus. Engin. Chem. 14: 621-623. C.A. 16: 2618.

(541) -------- --------
1928. FIXATION OF IRON BY HIDE SUBSTANCE. Indus. Engin. Chem. 20: 632-634.

(542) WILSON, J. A. and BEAR, A. W.
1926. EFFECT OF VEGETABLE TANNING ON THE COMBINATION OF COLLAGEN WITH ACID. Indus. Engin. Chem. 18: 84. C.A. 20: 517.

(543) WILSON, E. O. and YU, S. C.
1941. REACTION BETWEEN BASIC ALUMINUM SULFATE AND HIDE SUBSTANCE. Jour. Phys. Chem. 45: 160-177. C.A. 35: 2027.

G. PHYSICAL CHEMISTRY AND PHYSICS

(544) ABRAMSON, H. A., MOYER, L. S. and GORIN, M. H.
1942. ELECTROPHORESIS OF PROTEINS AND THE CHEMISTRY OF CELL SURFACES. 341 pp. New York. Reinhold.

(545) AM. LEATHER CHEM. ASSOC.
1941. "PROPOSED METHOD FOR MEASURING THE SHRINKAGE TEMPERATURE OF LEATHER." Oct. 17, 1941. Amer. Leather Chem. Assoc. Jour. 36: 682-683.

(546) (ANON.)
1937. THE STRUCTURE AND PHYSICO-MECHANICAL PROPERTIES OF RUBBER, COLLAGEN, CELLULOSE DERIVATIVES. Samml. v. Augsatzen. Leningrad, Gislegprom. 189 pp. (A bibliography). Russian. C.Z. 1938 I: 2153.

(528) PTSCHELIN, A. A. and GINZBURG, E. I.
1936. INFLUENCE OF FAT-LIQUORING ON THE PHYSICAL, MECHANICAL AND STRUCTURAL PROPERTIES OF CHROME-TREATED COLLAGEN TISSUES. Tsentral. Nauch-Issledovatel. Inst. Kozhevennoi Prom. Sbornik Rabot No. 9: 120-138. C.A. 31: 3326.

(529) SALCEDO, I. S. and HIGHBERGER, J. H.
1941. SOME FACTORS IN THE COLLAGEN-FORMALDEHYDE REACTION. Amer. Leather Chem. Assoc. Jour. 36: 271-292. C.A. 36: 3696.

(530) SCHACHOWSKOY, F. and FROHLICH, H. G.
1941. ZIRCONIUM TANNING. Kolloid Ztschr. 97: 336-339. C.A. 37: 1293.

(531) SCHIAPARELLI, C. and BUSSINO, G.
1927. CHROMIUM COLLAGENATES. Soc. Leather Trades Chem. Jour. 11: 531-550. C.A. 22: 1494.

(532) TAYA, S.
1940. CHROME TANNING. I. EFFECT OF NEUTRAL SALTS ON ADSORPTION OF CHROMIC OXIDE AND COAGULATING ACTION OF ANIONS ON COLLAGEN. Soc. Chem. Ind. Japan Jour. 43: Suppl. Binding 171-172.

(533) THEIS, E. R.
1938. STUDIES IN CHROME TANNING. PT. V. FURTHER EFFECTS OF PICKLING UPON THE CR_2O_3 DISTRIBUTION. Amer. Leather Chem. Assoc. Jour. 33: [illegible].

(534) --------
1944. THE PROTEIN-FORMALDEHYDE REACTION. I. COLLAGEN. Jour. Biol. Chem. [illegible] C.A. 38: 4968.

(535) --------
1945. STUDIES IN VEGETABLE TANNING. II. THE COLLAGEN-QUINONE REACTION AND ITS RELATION TO VEGETABLE TANNING. Amer. Leather Chem. Assoc. Jour. [illegible] C.A. 39: 5529.

(536) --------
1945 PROTEIN-FORMALDEHYDE REACTION. III. EFFECT OF TEMPERATURE AND DENATURATION. Jour. Biol. Chem. 157: 7-14. C.A. 39: 1886.

(537) --------
1945. PROTEIN-FORMALDEHYDE REACTION. IV. DENATURATION BY DEAMINIZATION OF COLLAGEN. Jour. Biol. Chem. 157: 15-22. C.A. 39: 1886.

(556) CHERNOV, N. V., LIPATOV, S. M., and FEL'DMAN, R. I.
1937. **ABSORPTION OF WATER BY COLLAGEN AND BY CHROME-TANNED LEATHER.** Kozhevenno-Obuvnaya Prom. 116, No. 6, 30-34. C.A. 32: 4375.

(557) CLARK, J. H.
1928. **REVERSIBLE CRYSTALLIZATION IN TENDONS AND ITS FUNCTIONAL SIGNIFICANCE.** Natl. Acad. Sci. Proc. 14: 526-532. C.A. 22: 3922.

(558) COCKBAIN, E. G.
1945. **SOME PHYSICOCHEMICAL ASPECTS OF TANNING AND DYEING PROCESSES.** Internatl. Soc. Leather Trades' Chem. Jour. 29: 102-117. C.A. 39: 5530.

(559) DEFORGE, A.
1935. **THE IONIZATION OF COLLAGEN.** Halle aux Cuirs (Suppl. Tech.) 25, 49, 73. JALCA 31: 65. 1936. C.Z. 1935 I: 3625; 1935 II: 170.

(560) --------
1935. **SWELLING OF COLLAGEN.** Halle aux cuirs 223-226. A brief review. C.A. 30: 322.

(561) EWALD, A.
1919. **COLLAGEN. I. SWELLING AND CONTRACTION OF CONNECTIVE TISSUE FIBRILS IN HOT WATER.** Hoppe-Seylers Ztschr. f. Physiol. Chem. 105: 115-134. C.A. 14: 950.

(562) FEL'DMAN, R. I.
1941. **FIXING OF WATER BY COLLAGEN AND CHROME-TANNED LEATHER.** Trudy Moskov. Tekhnol. Inst. Legkoi Prom. im. L. M. Kaganovicha No. 2: 171-187. C.A. 40: 2355.

(563) -------- and SOKOLOV, S. I.
1943. **DISPERSION OF COLLAGEN AND ITS TANNING PRODUCTS IN COPPER-AMMONIUM SOLUTION.** Legkaya Prom. 3, No. 5: 18-19. C.A. 40: 4683.

(564) FOKINA, N.
1937. **A STUDY OF THE INTRA- AND INTER-MICELLAR SWELLING OF COLLAGEN AT pH < 5.** Colloid Jour. USSR 3: 337-345. C.A. 32: 411.

(547) ARBUZOV, G. A.
1935. INFLUENCE OF TANNING WITH VARIOUS TANNIDES ON THE PHYSICAL AND MECHANICAL PROPERTIES OF THE COLLAGEN BUNDLES. Tsentral. Nauch-Issledovatel. Inst. Kozhevennoi Prom. Sbornik Rabot No. 8: 125-131. C.A. 31: 2856.

(548) BEEK, J. JR. and SOOKNE, A. M.
1939. ELECTROPHORESIS OF COLLAGEN. U. S. Natl. Bur. Standards Jour. Res. 23: 271-273. (Also in Amer. Leather Chem. Assoc. Jour. 34: 641-644. 1939).

(549) BENNETT, H. G.
1917. LYOTROPE SERIES AND THE THEORY OF TANNING. I. Soc. Leather Trades Chem. Jour. 1: 130-136. C.A. 12: 540.

(550) --------
1917. LYOTROPE SERIES AND THE THEORY OF TANNING. II. Soc. Leather Trades Chem. Jour. 1: 169-182. C.A. 12: 778.

(551) --------
1920. LYOTROPE INFLUENCE AND ADSORPTION IN THE THEORY OF TANNERY NETWORK. Soc. Leather Trades Chem. Jour. 4: 75-86. C.A. 14: 1817.

(552) BRAYBROOKS, W. E., McCANDLISH, D., and ATKIN, W. R.
1939. COLLAGEN STRUCTURE AND THE VEGETABLE TANNING PROCESS. Internatl. Soc. Leather Trades Chem. Jour. 23: 111-125; 165-180. C.A. 33: 213.

(553) BULANKIN, I. N. and KAPLAN, V. A.
1941. PHYSICOCHEMICAL AND CHEMICAL CHANGES DURING AGING OF COLLAGEN DERIVATIVES OF THE SKIN. Colloid Jour. USSR 7: 117-127. C.R. 1948 1: 2850. C.A. 37: 5492.

(554) CAMERON, D. H., McLAUGHLIN, G. D., and ADAMS, R. S.
1937. ON THE MECHANISM OF THE REACTION BETWEEN HIDE SUBSTANCE AND BASIC CHROME SULFATE. Amer. Leather Chem. Assoc. Jour. 32: [illegible].

(555) CHERBULIEZ, E., JEANNERAT, J., and MEYER, K. H.
1938. COLLAGEN AND RELATED SUBSTANCES. Ztschr. f. Physiol. Chem. 253: 241-254. C.A. 33: 1351.

(574) HERZOG, R. O. and GONELL, H. W.
1926. **CONCERNING COLLAGEN.** Collegium: 189. JALCA 22: 615. C.Z. 1926 II: 533.

(575) -------- and JANCKE, W.
1926. **COLLAGEN. II.** Deut. Chem. Gesell, Ber. 59 B: 2487-2489. C.A. 21: 1213.

(576) NAGEOTTE, J. and GUYON, L.
1934. **THE PHYSICO-CHEMICAL PROPERTIES OF COLLAGEN.** Assoc. des Anat. Bruxelles Compt. Rend. 25-28 Mars.

(577) HIGHBERGER, J. H.
1939. **ISOELECTRIC POINT OF COLLAGEN.** Amer. Chem. Soc. Jour. 31: 2302-2303. C.A. 33: 9039.

(578) JOVANOVITS, J. A. and ALGE, A.
1932. **STRUCTURAL CHANGES OF COLLAGEN HIDE FIBERS CAUSED BY ELECTROLYTES, BATES AND TANNIN SOLUTIONS.** Collegium. 215-231. C.A. 26: 6178.

(579) KATZ, J. R. and GERNGROSS, O.
1925. **GELATIN AND COLLAGEN.** Naturwissenschaften. 13: 900-903. C.A. 20: 528.

(580) -------- WEIDINGER, A.
1933. **ON THE INFLUENCE OF LYOTROPIC SUBSTANCES ON THE SHRINKAGE TEMPERATURE OF COLLAGENS.** Collegium: 85-88. ALCA Jour. 29: 183.

(581) -------- and WEIDINGER, A.
1933. **INFLUENCE OF LYOTROPE SUBSTANCES ON THE SHRINKAGE OF TEMPERATURE OF COLLAGEN. PT. II. ORGANIC SUBSTANCES WITH TWO OR MORE HYDROPHYLLIC GROUPS.** Collegium: 290-292. JALCA 29: 339.

(582) -------- --------
1933. **LYOTROPIC SERIES IN SWELLING AND ITS RELATION TO ORGANIC, NON-IONIZABLE SUBSTANCES. IV. INFLUENCE OF INORGANIC SALTS, THIOCYANATES AND ORGANIC SULFUR COMPOUNDS ON THE SHRINKING OF COLLAGEN.** Biochem. Ztschr. 259: 191-199. C.A. 27: 2615.

(583) -------- --------
1933. **LYOTROPIC SERIES IN SWELLING AND ITS RELATION TO ORGANIC, NON-IONIZABLE SUBSTANCES. V. INFLUENCE OF ORGANIC HALOGEN COMPOUNDS WITH HYDROPHILIC GROUPS UPON THE SHRINKING OF COLLAGEN.** Biochem. Ztschr. 259: 223-230. C.A. 27: 2615.

(565) GAMBLE, G. W.
1910. ON THE PROPERTIES OF CERTAIN COLLAGENOUS BODIES AND THEIR BEHAVIOR TOWARDS LIGHT WHEN ASSOCIATED WITH ALKALI BICHROMATES. Soc. Chem. Ind. Jour. 29: 65-69.

(566) GERNGROSS, O. and BACH, S.
1923. THE ISOELECTRIC POINTS OF GLUTIN FROM SKIN AND BONES. Biochem. Ztschr. 143: 542-552. C.A. 18: 2275.

(567) GUSTAVSON, K. H.
1926. SPECIFIC ION EFFECTS IN THE BEHAVIOR OF TANNING AGENTS TOWARD COLLAGEN TREATED WITH NEUTRAL SALTS. Fourth Colloid Symposium Monograph. 79-101. C.A. 21: 1769.

(568) --------
1946. EVIDENCE FOR THE RUPTURE OF INTERMOLECULARLY COORDINATED PEPTIDE BONDS IN THE HEAT DENATURATION (SHRINKAGE) OF COLLAGEN. Amer. Leather Chem. Assoc. Jour. 41: 47-58. C.A. 40: 2666.

(569) HALLA, F. and TANDLER, R.
1931 THE COLLAGEN FIBER. Ztschr. physik. Chem. Abt. B 12: 89-92. C.A. [illegible]: [illegible].

(570) HERINGA, G. C. and KRUYT, H. R.
1931. COLLAGEN AND GELATIN. A REVIEW. Chem. Weekbl. 28: 142-150. C.A. [illegible].

(571) -------- and LOHR, H. A.
1926. PHYSICOCHEMICAL STRUCTURE OF THE COLLAGENIC SUBSTANCE. I. SPIRAL ARRANGEMENT AND HYGROSCOPIC TORSION OF COLLAGENIC BUNDLES OF TENDONS [illegible] van Wetensch. te Amsterdam. Verhandel. 29: [illegible] Also in [illegible]. Akad. van Wetensch. te [illegible] en Natuurk. Afd. 35: 756-762. 1926.

(572) -------- and MINNAERT, M.
1926. PHYSICOCHEMICAL STRUCTURE OF THE COLLAGENIC SUBSTANCES. II. AN OPTICAL PHENOMENON [illegible]. Akad. van Wetensch. te Amsterdam. Verhandel. [illegible]: [illegible].

(573) -------, -------, and KOLKMEIJER, N. H.
1926. PHYSICOCHEMICAL STRUCTURE OF THE COLLAGENIC SUBSTANCE; SPIRAL FORMING AND THE SO-CALLED HYGROSCOPIC TORSION OF THE COLLAGENIC BUNDLE OF TENDONS [illegible]. Akad. van Wetensch. te Amsterdam. Afd. Natuurk. Verhandel. [illegible] en Natuurk. Afd. 35: pt. 2: 756, 763; 76[illegible].

(594) LLOYD, D. J.
1932. **PROPERTIES OF COLLAGEN FIBERS.** Soc. Chem. Ind. Jour. 51: 141-147 T. C.A. 26: 3955.

(595) --------
1935. **THEORY OF THE TANNING PROCESS WITH SPECIAL REFERENCES TO VEGETABLE TANNING AND CHROME TANNING.** Internatl. Soc. Leather Trades Chem. Jour. 19: 336-344. C.A. 29: 6791.

(596) --------
1935. **RECENT THEORIES OF THE CHEMISTRY OF TANNING.** Internatl. Soc. Leather Trades Chem. Jour. 19: 345-349. C.A. 29: 6791.

(597) --------
1941. **THE MOLECULAR STRUCTURE OF COLLAGEN FIBRILS.** Soc. Dyers and Colourists Jour. 57: 281-287.

(598) -------- and MARRIOTT, R. H.
1936. **SWELLING OF PROTEIN FIBERS. V. SWELLING OF SINGLE COLLAGEN FIBER BUNDLES UNDER LOAD.** Faraday Soc. Trans. 32: 932-939. C.A. 30: 6768.

(599) -------- -------- and PLEASS, W. B.
1933. **SWELLING OF PROTEIN FIBERS. I. SWELLING OF COLLAGEN.** Faraday Soc. Trans. 29: 554-563. C.A. 27: 2864.

(600) LOISELEUR, J.
1929. **ON THE PHENOMENA WHICH ACCOMPANY THE FLOCULATION OF COLLAGEN.** Soc. de Biol. Paris Compt. Rend. 102: 738-740.

(601) MARRIOTT, R. H.
1932. **SWELLING OF SINGLE COLLAGEN FIBER-BUNDLES.** Biochem. Jour. 26: 46-53. C.A. 26: 3488.

(602) MEUNIER, L. and LEVIET, L.
1929. **THE ABSORBENT PROPERTIES OF COLLAGEN.** Acad. des Sci. Paris Compt. Rend. 189: 911-913.

(603) MIKHAILOV, A. N. and BERLIN, M. I.
1932. **WATER DIFFUSION INTO COLLAGEN UNDER THE INFLUENCE OF TANNING.** Ovladenie Tekhnikoi: Kozhobumoe Proizvodstvo No. 2: 40 C.A. 27: 6009.

(584) -------- --------
1933. LYOTROPIC SERIES IN SWELLING AND ITS RELATION TO ORGANIC, NON-IONIZED SUBSTANCES XI. EFFECT OF SUBSTANCES WITH TWO OR MORE HYDROPHILE GROUPS ON THE SWELLING OF COLLAGEN. Biochem. Ztschr. 263: 421-427. C.A. 27: 5231.

(585) KAYE, M. and LLOYD, D. J.
1924. ON THE BIOCHEMISTRY OF SKIN, AND THE CHEMICAL BASIS OF SKIN SWELLING. Biochem. Jour. 18: 1043-1057.

(586) KRUYT, H. R.
1933. COLLOID CHEMISTRY OF COLLAGEN, GELATIN AND GLUE. Collegium: 741-748. *Also in:* Internatl. Soc. Leather Trades Chem. Jour. 17: 612-620. 1933. C.A. 28: 684.

(587) KUBELKA, V. and KNÖDEL, G.
1937. RELATION BETWEEN DEGREE OF SWELLING AND AMOUNT OF LIQUID ABSORBED BY HIDE POWDER IN ACID SOLUTION. Stiasny Festschr.: 182-190. JALCA 34: 114. C.A. 34: 6122.

(588) -------- --------
1938. PROCESS OF MEASURING SWELLING WITH HIDE POWDER AND GELATIN. II. Collegium: 49-54. C.A. 32: 6498.

(589) -------- and SAMEC, V.
1933. ADSORPTION AND SWELLING. IV. INFLUENCE OF TEMPERATURE ON THE SWELLING OF HIDE POWDER. Kolloid Ztschr. 64: 84-86. C.A. 27: 4436.

(590) -------- and TAUSSIG, I.
1926. STUDIES IN ADSORPTION AND SWELLING. Kolloid Chem. Beihefte. 22: 150-190. C.A. 20: 3369.

(591) KÜNTZEL, A.
1934. INNER STRUCTURE OF THE COLLAGEN FIBER. Collegium: 1-18. JALCA 29: 393.

(592) --------
1941. THE STRUCTURE OF THE COLLAGEN FIBER. Kolloid Ztschr. 96: 273-284. C.A. 36: 6865.

(593) KÜTHY, A. VON.
1932. SWELLING OF COLLAGEN FIBERS. Biochem. Ztschr. 244: 342-346. C.A. 26: 2634.

(635) WINETZKAJA, E. J.
1934. HYDRATION OF GELATIN AND COLLAGEN. (See Ref. 631, Vinetzkaya, E. Ya.).

(636) WÖHLISCH, E.
1928. THERMODYNAMICS OF ACID AND ALKALI CONTRACTION OF COLLAGEN TISSUE. THE THERMIC TENSION COEFFICIENT OF ISOMETRIC CONTRACTIONS. Ztschr. f. Biol. 87: 355-363. C.A. 22: 3699.

(637) --------
1932. THERMODYNAMICS OF COLLAGEN. COLLAGEN AND GELATIN. Biochem. Ztschr. 247: 329-336. C.A. 26: 3715.

(638) --------
1938. EQUILIBRIA OF FIBROUS COLLAGEN, RUBBER AND SIMILAR SYSTEMS DEPENDENT ON TENSION. Naturwissenschaften 26: 380. B. C. A. 1938 B: 1083.

(639) --------
1939. STATISTICAL KINETIC THEORY, THERMODYNAMICS AND BIOLOGICAL SIGNIFICANCE OF RUBBEROID ELASTICITY. Kolloid Ztschr. 89: 239-271. C.A. 34: 3967.

(640) -------- and DE ROCHEMONT, R.
1927. THERMODYNAMICS OF TEMPERATURE CHANGES IN COLLAGEN. Ztschr. f. Biol. 85: 406-434. C.A. 21: 3914.

(641) ZAIDES, A. I. and SOKOLOV, S. I.
1937. STRUCTURE AND MECHANICAL PROPERTIES OF COLLAGEN FIBERS. Tsentral. Nauch. Issledovatel. Inst. Kozhobuvnoi Prom., Stroenie i Fiz.-Mekhan. Svoistva Krauchuka, Kollagena i Proizvadnykh Tsellyulozy, Sbornik Rabot Fiz.-Khim. Otdela Ts-NIKP. 1937: 141-161. C.A. 35: 2358.

(642) -------- --------
1937. STRUCTURAL CHANGE IN THE COLLAGEN FIBERS AFTER TANNING. Tsentral. Nauch. Issledovatel. Inst. Kozhobuvnoi Prom., Stroenie i Fiz.-Mekhan. Svoistva Krauchuka, Kollagena i Proizvadnykh Tsellyulozy. Sbornik Rabot Fiz.-Khim. Otdela Ts-NIKP 1937: 162-180. C.A. 35: 2358.

(643) ZOTOV, G. V.
1946. ELECTROCHEMICAL PROPERTIES OF COLLAGEN AS A BASIS FOR THE QUANTITATIVE CHARACTERISTICS OF EQUILIBRIUM IN THE SYSTEM COLLAGEN-HYDROCHLORIC ACID. Jour. Applied Chem. USSR 19: 160-169. 1946. C.A. 41: 899. JALCA 42: 532.

(625) -------- --------
1943. **ACID- AND BASE-BINDING CAPACITY OF HEAT DENATURED COLLAGEN.** Jour. Biol. Chem. 148: 105-110. C.A. 37: 3778.

(626) -------- --------
1943. **ACID-, BASE-, AND SALT-BINDING CAPACITY OF SALT-DENATURED COLLAGEN.** Jour. Biol. Chem. 148: 603-609. C.A. 37: 6283.

(627) -------- and STEINHARDT, R. G.
1942. **STUDIES IN ANIMAL SKIN PROTEINS. IV. THE THEORETICAL SIGNIFICANCE OF THE SHRINK TEMPERATURE.** Amer. Leather Chem. Assoc. Jour. 37: 433-449.

(628) THOMAS, A. W. and FOSTER, S. B.
1925. **ACTION OF ULTRAVIOLET LIGHT ON HIDE PROTEIN.** Amer. Leather Chem. Assoc. Jour. 20: 490-494.

(629) -------- and KELLY, M. W.
1922. **THE ISOELECTRIC POINT OF COLLAGEN.** Amer. Chem. Soc. Jour. 44: 195-201. C.A. 16: 1679.

(630) -------- --------
1925. **THERMOLABILITY OF COLLAGEN.** Amer. Chem. Soc. Jour. 47: 833-836. C.A. 19: 1354.

(631) VINETZKAYA, E. YA.
1934. **HYDRATION OF GELATIN AND COLLAGEN.** Tzentral. Nauch.-Issledovatel. Inst. Kozhevennoi Prom., Sbornik Rabot No. 2: 77-91. C.A. 28: 7588.

(632) WILSON, J. A.
1920. **VEGETABLE TANNING AS A COLLOID-CHEMICAL PROCESS.** Amer. Leather Chem. Assoc. Jour. 15: 374-380. C.A. 14: 2275.

(633) --------
1937. **ELECTRONIC THEORY OF TANNING. VI. SOME NEW VIEWS OF CHEMICAL COMBINATION.** Amer. Leather Chem. Assoc. Jour. 32: 494-513. C.A. 32: 3655.

(634) --------
1941. **THE NATURE OF THE HYDROGEN BOND AND THE ELECTRONIC THEORY OF TANNING.** Amer. Leather Chem. Assoc. Jour. 36: 584-590.

(615) SOKOLOV, S. I.
1937. **THE PHYSICAL CHEMISTRY OF COLLAGENS AND ITS DERIVATIVES.** Leningrad, Gislegprom. (182 pp.) (A Bibliography) Russian. C.Z. 1937 I: 4455.

(616) -------- and FEL'DMAN, R. I.
1944. **STUDY OF THE STABILITY OF THE PRODUCTS OF TANNING GELATIN AND COLLAGEN.** Legkaya Prom. (6) 20-22. C.A. 39: 4251.

(617) THAUREAUX, J.
1945. **PROPERTIES OF ACID SOLUTIONS OF COLLAGENS.** Soc. de Chim. Biol. Bul. 27: 327-329. A review. C.A. 40: 4751.

(618) --------
1945. **THERMIC TRANSFORMATION AND SOLUBILITY OF COLLAGENS.** Soc. de Chim. Biol. Bul. 27: 493-495. C.A. 40: 5461.

(619) THEIS, E. R.
1942. **ANIMAL-SKIN PROTEINS. V. THE PRACTICAL SIGNIFICANCE OF THE SHRINK TEMPERATURE.** Amer. Leather Chem. Assoc. Jour. 37: 499-511. C.A. 37: 2212.

(620) THEIS, E. R.
1946. **RELATION OF SWELLING TO SHRINKAGE TEMPERATURE OF COLLAGEN.** Faraday Soc. Trans. 42B, 244-249. C.A. 42, 7802g.

(621) -------- and BLUM, W. A.
1942. **STUDIES IN ANIMAL-SKIN PROTEINS. VI. SIGNIFICANCE OF SHRINK TEMPERATURE IN VEGETABLE TANNING.** Amer. Leather Chem. Assoc. Jour. 37: [illegible] C.A. 37: 2212.

(622) -------- and JACOBY, T. F.
1940. **STUDIES IN ANIMAL SKIN PROTEINS. I. THE ACID-BASE COMBINATION OF COLLAGEN PREPARED FROM ANIMAL SKIN.** Amer. Leather Chem. Assoc. Jour. [illegible] C.A. 34: 3531.

(623) -------- --------
1941. **STUDIES IN ANIMAL SKIN PROTEINS. III. COMBINATION OF ACID OR BASE WITH THE PROTEINS OF SILK, FIBROIN, HAIR AND COLLAGEN.** Amer. Leather Chem. Assoc. Jour. 36: 545-567. C.A. 36: 2437.

(624) -------- --------
1942. **ACID-BASE BINDING CAPACITY OF COLLAGEN.** Jour. Biol. Chem. 146: 163-169. C.A. 37: 1732.

(604) PAGE, R. O.
1933. NATURE OF THE COMBINATION OF WATTLE-BARK TANNIN WITH COLLAGEN. Amer. Leather Chemists Assoc. Jour. 28: 93-113.

(605) -------- and GILMAN, J. A.
1927. INFLUENCE OF H-ION CONCENTRATION AND VALENCY OF ADDED ANION ON PLUMPING IN TAN LIQUORS. Indus. Engin. Chem. 19: 251-252.

(606) PANKHURST, K. G. A.
1947. "INCIPIENT SHRINKAGE" OF COLLAGEN AND GELATIN. Nature 159: 538.

(607) PAVLOV, S. A. and SHESTAKOVA, I. S.
1941. NEUTRAL SALTS AND THE BOILING TEMPERATURE OF COLLAGEN. Legkaya Prom. 1(3) 33-34. C.Z. 1943 II: 400. C.A. 38: 4828.

(608) PORTER, E. C.
1921. SWELLING OF HIDE POWDER. I. Internatl. Soc. Leather Trades Chem. Jour. 5: 259-267. JALCA 17: 128. C.A. 16: 172.

(609) --------
1922. SWELLING OF HIDE POWDER. PART II. Internatl. Soc. Leather Trades Chem. Jour. 6: 83 89. JALCA 17: 308. 1922: 303 A. C.A. 16: 1883.

(610) --------
1922. SWELLING OF HIDE POWDER. III. Internatl. Soc. Leather Trades Chem. Jour. 6: 417-425. 1923: 152 A. C.A. 17: 1160.

(611) POWARNIN, G. and AGGEEW, N.
1924. THE NATURE OF THE TANNING PROCESS. IV. ON THE SHRINKING OF HIDES AND LEATHER. Collegium: 198-209. C.A. 18: 3488. ALCAJ [illegible] 1924 II 1650.

(612) PROCTER, H. R. and WILSON, J. A.
1923. COLLAGEN AND GELATIN. FIFTH REPORT ON COLLOIDS. Brit. Assoc. Adv. Sci. [illegible]: [illegible]. Review of recent progress. C.A. 18: 599.

(613) SCHADE, H. and MENSCHEL, H.
1922. SWELLING MEASUREMENTS ON HUMAN CONNECTIVE TISSUES AND THEIR BEARING ON M. H. FISCHER'S THEORY OF ACID FORMATION IN EDEMA. Kolloid-Ztschr. [illegible]: 171-181. C.A. 17: 147.

(614) SHIMIDZU, M.
1932. ON THE ISOELECTRIC POINT OF COLLAGEN. Collegium: 794-798. ALCA Jour. 28: 411 (1933).

(654) -------- --------
1927. **OIL TANNAGE OF SKINS.** Intern. Soc. Lea. Trades Chem. J. 11: 559-576. C.A. 22: 1494.

(655) -------- --------
1928. **THE OIL TANNING OF SKINS.** Chimie et Industrie. Special No. 706-715. C.A. 22: 4866.

(656) **CHATER, W. J.**
1928. **EFFECT OF HEAT ON WETTED VEGETABLE-TANNED LEATHER.** Intern. Soc. Lea. Trades Chem. 12: 544-558. C.A. 23: 1768.

(657) --------
1928. **EFFECTS OF HEAT ON WETTED VEGETABLE-TANNED LEATHERS. II.** Intern. Soc. Lea. Trades Chem. Jour. 12: 608-614. C.A. 23: 2596.

(658) --------
1929. **EFFECT OF HEAT ON WETTED VEGETABLE-TANNED LEATHER. III.** Internatl. Soc. Leather Trades Chem. Jour. 13: 24-36. C.A. 23: 4367.

(659) --------
1929. **EFFECT OF HEAT ON WETTED VEGETABLE-TANNED LEATHERS. IV.** Internatl. Soc. Leather Trades Chem. Jour. 13: 427-437. C.A. 24: 4420.

(660) ---------
1930. **EFFECT OF HEAT ON WETTED VEGETABLE-TANNED LEATHERS. V.** Internatl. Soc. Leather Trades Chem. Jour. 14: 28-36. C.A. 24: 4420.

(661) --------
1930. **EFFECT OF HEAT ON WETTED VEGETABLE-TANNED LEATHERS. VI.** Internatl. Soc. Leather Trades Chem. Jour. 14: 133-153. C.A. 24: 4420.

(662) **CHESHIRE, A.**
1943. **AN ERROR IN THE SHAKE METHOD OF TANNIN ANALYSIS.** Internatl. Soc. Leather Trades Chem. Jour. 27: 1-2. C.A. 37: 5885.

(663) **COLIN-RUSS, A.**
1940. **TRUE WATER SOLUBLES AND COMBINED TANNING MATTER. A CRITICAL STUDY.** Internatl. Soc. Leather Trades Chem. Jour. 24: 235-243. C.A. 34: 6475.

H. LEATHER, TECHNOLOGY INDUSTRIAL APPLICATIONS AND PRODUCTS.

(644) ARBUZOV, G. A.
1928. ON THE HYDROLYSIS OF LEATHER. IV. ON THE HYDROLYSIS OF CHROME-TANNED HIDE POWDER AND ON THE COMBINATION OF CHROME WITH COLLAGEN. Cuir Tech. 21: 203-208. C.Z. 1928 I: 2895-2896.

(645) BABAKINA, V. G.
1946. SODIUM FLUOSILICATE - AN ANTISEPTIC IN LEATHER PRODUCTION. Legkaya Prom., No. 9/10, 17-18. C.A. 41: 3618.

(646) BOULANGER, H.
1907. MICROSCOPIC EXAMINATION OF LEATHER. Bul. Soc. Industr. du nord de la France., thr. ch La halle aux cuirs, 1908: 592, 610, 625, 641, 657. C.A. 3: 2252.

(647) BRAYBROOKS, W. E.
1938. THE EFFECT OF HEAT ON WET LEATHER. Internatl. Soc. Leather Trades Chem. Jour. 22, 533-537. C.A. 33: 1172.

(648) BRIGGS, P. S.
1930. THE LIMITS OF ACIDITY AND TEMPERATURE IN CLEARING SEMI-TANNED SHEEPSKINS. Internatl. Soc. Leather Trades Chem. Jour. 14: 244 253. C.A. 24: 4633.

(649) BUZÁGH, A.
1941. THE CONDITIONS OF FORMATION OF ARTIFICIAL COLLAGEN FIBERS. Akad. der Wiss. Wien. Math.-Nat. Kl. Anz. 80: 99-111. C.A. 36: 2774.

(650) --------
1942. CONDITIONS FOR THE PRODUCTION OF ARTIFICIAL COLLAGEN FIBERS. Kolloid Ztschr. 101: 119-156. C.A. 39: 4228[6].

(651) CASABURI, V. and CORRODINI, C.
1936. METHOD FOR DETERMINING STABILITY OF SOLE (LEATHER) (METHOD C. C.). Boll. staz. sper. ind. pelli mat. conianti 14: 345-[illegible]. C.A. [illegible]: 8983.

(652) -------- --------
1937. DETERMINATION OF THE DEGREE OF STABILITY OF SOLE LEATHERS. Cuir Tech. 26: 20. [illegible] 401. C.A. 31: 7285.

(653) CHAMBARD, P. and MICHALLET, L.
1927. NOTE ON THE OIL TANNAGE OF SKINS. Cuir Tech. 16: 520. C.A. 22: 1055.

(674) --------
1942. **BEHAVIOR OF TANNED COLLAGEN TOWARD TRYPSIN.** Svensk Kem. Tidskr. 54: 249-256. C.A. 38: 4467. C.A. 1943 I: 1638.

(675) HIGHBERGER, J. H.
1940. **PROGRESS IN THE FUNDAMENTAL CHEMISTRY OF SKIN PROTEINS AND TANNING PROCESSES.** Hide & Leather 99 (15) 26-32; 99 (19) 3-4; 99 (24) 18-23. C.A. 34: 5309.

(676) -------- and RETZSCH, C. E.
1938. **A METHOD FOR THE DETERMINATION OF FORMALDEHYDE IN FORMALDEHYDE-TANNED LEATHER.** Amer. Leather Chem. Assoc. Jour. 33: 341-352.

(677) HOBBS, R. B.
1940. **SHRINKAGE TEMPERATURE OF LEATHER.** Amer. Leather Chem. Assoc. Jour. 35: 272.287.

(678) HOUGH, A. T.
1931. **FIXATION OF TANNIN IN LEATHER AND MODIFICATION OF ITS CHARACTERISTICS.** Internatl. Soc. Leather Trades Chem. Jour. 15: 41[illegible]-415. C.A. 2[illegible] 57[illegible]2.

(679) KANAGY, J. R.
1936. **SOLUBLE DECOMPOSITION PRODUCTS IN AGED VEGETABLE-TANNED LEATHERS.** U. S. Natl. Bur. Stand. Jour. Res. 17: 247-259.

(680) KÜNTZEL, A.
1929. **DOUBLE REFRACTION OF TANNED COLLAGEN FIBERS DEPENDING ON SHAPE.** Collegium. 207-214. C.A. 23: 5347.

(681) --------
1932. **A SIMPLE METHOD FOR RECOGNITION OF FORMALDEHYDE-TANNED LEATHER.** Collegium: [illegible]4-[illegible]4[illegible]. JALCA 2[illegible]: 171.

(682) --------
1936. **MINERAL TANNING. VI. THE CAUSE OF THE LEATHER-LIKE DRYING OF CHROME-TANNED HIDE.** Collegium: 625-635. JALCA 32: 468. C.A. 31: 3[illegible]6.

(683) --------
1937. **THE SCIENTIFIC BASIS OF CHEMICAL DEPILATING OF ANIMAL SKIN.** Klepzig's Text. Ztschr. 4[illegible] 147-151. C.Z. 1937 I: 3908. Text Inst. Jour. Abstracts 1[illegible]7, p. 2[illegible]7.

(664) COOMBS, F. A.
1938. THE LEATHER INDUSTRY. Austral. Chem. Inst. Jour. Proc. 5: 124-134. C.Z. 1938 II: 242.

(665) CROSS, C. F., GREENWOOD, C. V., and LAMB, M. C.
1919. COLLOIDAL TANNIN COMPOUNDS AND THEIR APPLICATION. Soc. Dyers and Colourists Jour. 35: 62-68. C.A. 13: 2614.

(666) DEFORGE, A.
1937. CHEMICAL AND PHYSIOLOGICAL ASPECTS OF TANNING. Rev. Chim. Ind. Monit. Sci. Quesneville 46: 130-136, 168-174, 205-213, 227-231. JALCA 33: 489. 1938. C.Z. 1937 II: 3566.

(667) DEMIN, V. S.
1941. MANUFACTURE OF COLLAGEN. Jour. Chem. Ind. USSR 18 (6) 31-32. C.Z. 1942 II: 2663. C.A. 38: 2521.

(668) FERIZ, H.
1940. CATGUT AND COLLAGEN. Nederland. Tijdschr. Geneeskunde 84: 804-811. C.A. 34: 3876.

(669) FAHRION
1908. A NEW METHOD OF TESTING LEATHER. Collegium Nos. 338-339: pp. 459-501. Also reprinted in Chemiker Zeitung, 1908, No. 75. ALCAJ 4: 60..

(670) GAVRILOV, N. I. and KAVERZNEV, E. D.
1931. SEPARATION OF SOME OF THE DIKETOPIPERAZINES OF LEATHER. Ovladenie Tekhnikoi: Kozhevennoe Proizvodstvo 1931, No. 2: 2[illegible]. C.A. 27: 6010.

(671) GERNGROSS, O.
1928. PROGRESS IN THE FIELD OF TANNING CHEMISTRY AND TECHNIQUE. Ztschr. f. Angew. Chem. 41: 221-226, 254-262. C.A. 22: 4269.

(672) GREEN, R. W.
1945. MOISTURE CONTENT OF CHROME LEATHER. Amer. Leather Chem. Assn. Jour. 40: 78-3.5. C.A. 40: 2333.

(673) GUSTAVSON, K. H.
1937. PRELIMINARY NOTE ON SOME THEORETICAL BEARINGS OF THE THERMAL STABILITY OF CHROME LEATHER UPON THE NATURE OF THE CHROME-COLLAGEN COMPOUND. Internatl. Soc Leather Trades Chem. Jour. 21: 4-8. C.A. 31: 2858.

(694) RAUTENSTRAUCH, W.
1923. SUPPRESSION OF COLLAGEN LOSSES DURING DEPILATION. Halle aux cuirs No. 7: 204-206. C.A. 17: 3805.

(695) REZABEK, G.
1938. LOSSES OF HIDE SUBSTANCE DURING THE OPERATION OF SOAKING. Internatl. Soc. Leather Trades Chem. Jour. 22: 346-352. C.A. 32: 9543.

(696) SADIKOV, V. S.
1926. BIOCHEMICAL PROBLEMS IN LEATHER MANUFACTURE. Collegium: 356-363. C.A. 20: 3833.

(697) --------
1927. SUITABILITY OF TENDON COLLAGEN FOR THE DETERMINATION OF TANNIN IN TANNIN EXTRACTS. Collegium: 76-85. C.A. 21: 1895.

(698) SCHIAPARELLI, C. and CARREGGIO, L.
1927. THE CHEMICAL PROCESSES OF COMBINED TANNING. R. Staz. Industria Pelli. Bull. 5: 326-327. C.A. 22: 2484. C.Z. 1928 I: 2697.

(699) SPIERS, C. H.
1932. BIBLIOGRAPHY OF PAPERS ON THE PHYSICAL PROPERTIES OF LEATHER. V. Internatl. Soc. Leather Trades Chem. Jour. 1[illegible]: 449-[illegible]. (Optical properties of collagen fibers.) C.A. 2[illegible]: [illegible].

(700) STECKER, H. C. and HIGHBERGER, J. H.
1942. QUINONE TANNAGE. I. THE WEIGHT INCREASES OF COLLAGEN IN BUFFERED QUINONE SYSTEMS AND ITS RELATION TO OXIDATION. Amer. Leather Chem. Assn. Jour. [illegible]: 226-240. C.A. 36: 5606.

(701) STIASNY, E.
1923. SOME MODERN PROBLEMS IN LEATHER CHEMISTRY. Science 57: 1[illegible]-185. C.A. 17: [illegible].

(702) --------
1925. REPORT OF WORK IN PROGRESS AT DARMSTADT INSTITUTE OF LEATHER CHEMISTRY. Gerber 51: 165-167; 173-176. C.A. 20: 122.

(703) --------
1936. DEVELOPMENTS IN THE THEORY OF TANNING. Internatl. Soc. Leather Trades Chem. Jour. 20: 50-60. Also in: Collegium 1936: 8-1[illegible]. Cuir Tech. 25: 34-39. 1936. C.A. 30: 2793.

(684) LEPLAT, G.
1936. THE VARIETY OF CURRENT HISTOLOGICAL METHODS INCREASES THEIR POSSIBLE CONTRIBUTION TO THE LEATHER INDUSTRY. Internatl. Soc. Leather Trades Chem. Jour. 20: 61-69. C.A. 30: 2792. Also in Cuir Tech. 25: 50-54. 1936. C.Z. 1936 I: 3064.

(685) LLOYD, D. J.
1938. EXAMINATION OF DIFFERENT TYPES OF LEATHER BY MEANS OF X-RAYS. Internatl. Soc. Leather Trades Chem. Jour. 22: 558-561. C.A. 33: 1534.

(686) MARQUARD, W.
1943. THE PREPARATION OF ADHESIVES BY THE COOKING PROCESS AFTER TREATMENT WITH TARTARIC ACID. Ztschr. Fleisch-u. Milchhyg. 53: 231-233. C.A. 39: 2003.

(687) MCLAUGHLIN, G. D. and PORTER, R. E.
1920. SWELLING AND FALLING OF WHITE HIDE IN VEGETABLE TAN LIQUIDS. Amer. Leather Chem. Assoc. Jour. 15: 557-581.

(688) -------- and O'FLAHERTY, F.
1926. MICRO-TANNOLOGY. Amer. Leather Chem. Assoc. Jour. 21: 338-351.

(689) -------- and THEIS, E. R.
1945. CHEMISTRY OF LEATHER MANUFACTURE. New York, Reinhold. 800 pp.

(690) MERRILL, H. B.
1929. ACTION OF WATER ON VEGETABLE-TANNED LEATHER. I. RATE OF REMOVAL OF UNCOMBINED SOLUBLE MATTER. Amer. Leather Chem. Assoc. Jour. 24: 233-242.

(691) --------
1930. ACTION OF WATER ON VEGETABLE-TANNED LEATHER. II. RESISTANCE OF THE COLLAGEN-TANNIN COMPOUND TO HYDROLYSIS UPON LONG WASHING. Amer. Leather Chem. Assoc. Jour. 25: 173-182. C.A. 29: 4420.

(692) PAGE, R. O. and HOLLAND, H. C.
1932. NATURE OF THE WATER SOLUBLES IN LEATHER TANNED WITH WATTLE BARK. PT. III. Amer. Leather Chem. Assoc. Jour. 27: 432-453.

(693) PORTER, R. E.
1925. DIRECT MEASUREMENT OF PLUMPING POWER OF TAN LIQUORS. COMMITTEE REPORT. Amer. Leather Chem. Assoc. Jour. 20: 282-293.

I. PATENTS

(713) BERGER, E. E. F.
1934. COLLAGENIC SUBSTANCES. Fr. Patent 764, 847 May 29. C.A. 28: 6024.

(714) BERGMANN, M. and KOESTER, H.
1925. DISSOLUTION AND REPRECIPITATION OF COLLAGEN OR GLUTIN. German Pat. 442,520. Jan. 2. B.C.A. 1927: 949.

(715) CAMPBELL, C. H.
1926. TANNED LEATHER, FILLER THERFOR, AND PROCESS RELATING THERETO. U. S. Pat. 1,586,964. June 1.

(716) -------- (TO AMERICAN GLUE CO.)
1928. RUBBER COMPOSITION. U. S. Pat. 1,683,862. Sept. 11. C.A. 22: 4274.

(717) DEWSBURY, W. G. and DAVIES, A.
1933. TREATMENT OF IMPROVED MATERIALS, (LUBRICATING, FUEL AND TRANSFORMER OILS, PRINTING INK) CONTAINING COLLAGEN. Brit. Pat. 425.049. June 9, 1933. B.C.A. 1935: 470.

(718) -------- --------
1935. COMPOSITIONS CONTAINING COLLAGEN PRODUCTS AND APPLICATION THEREOF. Brit. Pat. 471,360. July 5, 1935. C.A. 30: 193.

(719) -------- --------
1935. COMPOSITIONS CONTAINING COLLAGEN PRODUCTS. French Pat. 785,114. Aug. 2. C.A. [illegible]: 542.

(720) -------- --------
1938. COLLAGEN PRODUCTS SUITABLE FOR LUBRICATING COATING, ETC. U. S. Pat. 2,1[illegible]. Jan. 11, 1938. C.A. 32: 2386.

(721) -------- --------
1938. OILS. Ger. Pat. [illegible]. 15, 1938. (OILS CONTAINING COLLAGEN). C.A. [illegible]: [illegible]6.

(722) FLEISCHMANN, K.
1943. FIBERS FROM COLLAGEN. Fr. Pat. 7[illegible],211. Oct. 14, 1943. C.A. 40: 486.

(704) THEIS, E. R. and ESTERLY, A. R.
1940. STUDIES IN ALDEHYDE TANNAGE. IV. THE EFFECT OF HYDROGEN-ION CONCENTRATION DURING TANNAGE UPON THE SHRINK TEMPERATURE OF THE LEATHER. Amer. Leather Chem. Assoc. Jour. 35: 563-576.

(705) THEIS, E. R. and GANZ, J.
1939. STUDIES IN CHROME TANNING PT. VII. THE EFFECT OF VARIOUS PICKLES UPON CHROMIUM ACETATE TANNAGE. Amer. Leather Chem. Assoc. Jour. [illegible]

(706) -------- and GOETZ, A. W.
1931. A CRTICAL STUDY OF PICKLING. Amer. Leather Chem. Assoc. Jour. 26: 505-5[illegible].

(707) -------- and KALB, G. H.
1938. STUDIES IN CHROME TANNING. III. A CRITICAL STUDY OF THE TWO BATH PROCESS. Amer. Leather Chem. Assoc. Jour. 33: 120-144.

(708) -------- and WEIDNER, C. L.
1938. STUDIES IN CHROME TANNING. IV. THE EFFECT OF PICKLING UPON THE Cr_2O_3 DISTRIBUTION. Amer. Leather Chem. Assoc. Jour. 33: 581-592.

(709) THOMAS, A. W. and SEYMOUR-JONES, F. L.
1924. ACTION OF TRYPSIN UPON DIVERSE LEATHERS. Indus. Engin. Chem. [illegible]

(710) WILLIAMS, D.
1939. USE OF SELENIUM IN KJELDAHL DIGESTION OF LEATHER FOR NITROGEN. Amer. Leather Chem. Assoc. Jour. 34: 261-263. C.A. [illegible]

(711) WILSON, J. A.
1928. CHEMISTRY OF LEATHER MANUFACTURE. Ed. 2. 2 v. New York, Chemical [illegible]

(712) -------- and GALLUN, A. F.
1923. POINTS OF MINIMUM PLUMPING OF CALF SKIN. Indus. Engin. Chem. 15. [illegible]

(733) ----------

1936. **THREADS, BANDS, FILMS, ETC., FROM ELASTIN-CONTAINING OR COLLAGENOUS ANIMAL FIBROUS MATERIAL SUCH AS THAT OF SINEWS.** Wilhelm Schulte, U. S. Pat. 2,039,202. Apr. 28. C.A. 30: 4274.

(734) ----------

1938. **MATERIAL OBTAINED FROM FIBROUS ANIMAL SUBSTANCES.** Brit. Pat. 487,258. June 17. C.A. 33: 326.

(735) ----------

1939. **REABSORPTIVE, POROUS MATERIAL FOR TAMPONS, CAPSULES, SUPPOSITORIES AND THE LIKE PREPARED FROM COLLAGEN.** Dutch Patent 46,554. Sept. 15. C.Z. 1939 II: 3850.

(736) ----------

1941. **THREAD, STRINGS, FOILS, ETC., FROM ANIMAL ELASTIN AND COLLAGEN FIBERS.** Ger. Pat. 708,243, June 5. C.A. 37: 4928.

(737) PICKER, W.

1944. **(TO THE PROCTOR & GAMBLE CO.)**
COLLAGEN FIBERS SUITABLE FOR USE AFTER LONG STORAGE. U. S. Pat. 2,340,984. Feb. 8. C.A. 38: 4[illegible]9.

(738) STAGNER, B. A.

1923. **HYDROLYZED COLLAGEN FOR NITROGEN NUTRITION OF YEAST.** U. S. Pat. 1,457,319. June 5. C.A. 17: 2471.

J. GELATIN

(739) ALEXANDER, J.

1923. **GLUE AND GELATIN.** New York Chem. Cat. Co. 236 pp. A.C.S. Monograph Series.

(740) AMES, W. M.

1944. **PREPARATION OF GELATIN. II. METHODS OF SHORTENING THE SOAKING PERIOD.** Soc. Chem. Indus. Jour. 63: 234-241. C.A. 39: 1072.

(741) --------

1944. **PREPARATION OF GELATIN. III. LOSS OF N WHEN COLLAGEN IS CONVERTED INTO GELATIN.** Soc. Chem. Indus. Jour. 63: 277-280. C.A. 39: 1072.

(723) FREUDENBERG, CARL (Carl Freudenberg G.M.B.H.)
1936. RENDERING FIBERS OR THREADS RESISTANT TO POLISHING. Fr. Pat. 804,897, Nov. 4, 1936. C.A. 31: 3736.

(724) --------
1936. TEXTILE THREADS. Brit. Pat. 457,912, Dec. 8, 1936. C.A. 31: 2838.

(725) GRETTIE, D. P.
1945. METHOD OF EXTRACTING GLUE AND GELATIN. U. S. Pat. 2,384,673. Sept. 11.

(726) HIGHBERGER, J. H. and KERSTEN, H. J.
1945. (TO FOUNDATION OF THE RESEARCH LABORATORY OF THE TANNERS' COUNCIL OF THE U. S. OF AMERICA AT THE UNIV. OF CINCINNATI, INC.). COLLAGEN FILAMENTS AND PREPARATION THEREOF. U. S. Pat. 2,374,201. Apr. 24, 1945. C.A. 40: 486.

(727) KENYON, J., SILBERSTEIN, V. and ATTARI, H.
1945. GELATIN AND GLUE FROM HIDES. Brit. Pat. 568,261, Mar. 27. C.A. 41: 3648.

(728) N. V. KONINKLIJKE PHARMACEUTISCHE FABRIEKEN VOORHEEN BROCADES-STHEEMAN AND PHARMACIA.
1934. ARTIFICIAL THREADS, CORDS, FILMS, ETC. Fr. Pat. 773,638. Nov. 2. C.A. 29: P 1543.

(729) LANGE, GUSTAV (TO CARL FREUDENBERG G.M.B.H.)
1937. PROCESS FOR RENDERING FIBERS OR THREADS FROM ANIMAL COLLAGEN IRONPROOF. U. S. Pat. 2,103,163, Dec. 21. C.A. 32: 1512.

(730) MICHELMAN, J.
1926. PROCESS FOR OBTAINING PYRROL, PYRROL DERIVATIVES AND PYROCOLL FROM ANIMAL WASTES. U. S. Pat. 1,572,552. Feb. 9. C.A. 20: 1551.

(731) N. V. KONINKLIJKE PHARMACEUTISCHE FABRIEKEN VOORHEEN BROCADES-STHEEMAN AND PHARMACIA.
1935. FIBERS, THREADS, ETC. FROM ELASTIN AND COLLAGEN-CONTAINING MATERIALS. Brit. Pat. 422,990, Jan. 23, 1935. C.A. 29: 4526.

(732) ----------
1935. THREADS, FILMS, ETC., FROM ELASTIN AND (OR) COLLAGEN. French Pat. 45,424, Sept. 4, 1935. C.A. 30: 2670.

(753) DULITSKAYA, R. A. and SOKOLOV, S. I.
1937. **THE STRUCTURE AND PHYSICOMECHANICAL PROPERTIES OF GELATIN GELS.** Tsentral. Nauch.-Issledovatel. Inst. Kozhobuvnoi Prom., Stroenie i Fiz.-Mekhan. Svoistva Kauchuka, Kollagena a Proizvodnykh Tsellyulozy. Sbornik Rabot Fiz.-Khim. Otdela Ts-NIKP. 122-140. C.A. 35: 2357.

(754) EGGERT, J. and BINCER, H.
1932. **THE DEPENDENCE OF THE OSMOTIC PRESSURE AND THE MICELLAR WEIGHT OF GELATIN SOLUTIONS ON THE TEMPERATURE OR ON THE PREVIOUS HISTORY OF THE SOLUTION.** Comments on Frankel's article Biochem. Ztschr. 240: 149-155, 1931. Criticism. Biochem. Ztschr. 247: 85.

(755) -------- and REITSTÖTTER, J.
1926. **MOLECULAR WEIGHT AND GEL CONDITION OF GELATIN.** Ztschr. f. Phys. Chem. 123: 363-382. C.A. 21: 201.

(756) FENN, W. O.
1918. **THE EFFECTS OF ELECTROLYTES ON GELATIN AND THEIR BIOLOGICAL SIGNIFICANCE. III. THE EFFECTS OF MIXTURES OF SALTS ON THE PRECIPITATION OF GELATIN BY ALCOHOL ANTAGONISM.** Jour. Biol. Chem. 34: 141-160.

(757) FRANKEL, M.
1931. **INFLUENCE OF TEMPERATURE AND OF PREVIOUS HISTORY OF THE SOLUTION OF GELATIN ON THE OSMOTIC PRESSURE AND THE WEIGHT OF THE MICELLES.** Biochem. Ztschr. 240: 149-155. C.A. 26: 18.

(758) --------
1932. **EFFECT OF TEMPERATURE AND PREVIOUS HISTORY OF GELATIN SOLUTION UPON ITS OSMOTIC PRESSURE AND MICELLAR WEIGHT.** A reply to Eggert and Bincev's article, (Biochem. Ztschr. 247: 85, 1932) Polemical. Biochem. Ztschr. 249: 476-77. C.A. 26: 4995.

(759) GERNGROSS, O.
1924. **RECENT PROGRESS AND VIEWS RELATING TO GLUE AND GELATIN.** Collegium 480-485. (JALCA 20: 530). *also in* Ztschr. f. angew. chem. 38: 85-95. 1925 (C.A. 1925 I: 2135).

(760) GERNGROSS, O. and S. BACH
1923. **SHIFT OF THE ISO-ELECTRIC POINT OF GELATIN BY FORMALDEHYDE.** Biochem. Ztschr. 143: 55-841. C.A. 18: 2275. *also in* Collegium 1922: 350-351. C.A. 17: 2070.

(761) --------, HERRMANN, K., and ABITZ, W.
1930. **FINE STRUCTURE OF GELATIN MICELLAE.** Biochem. Ztschr. 228: 409-425. *also in* Collegium. 1931: 53-67. C.A. 25: 1116.

(742) --------
1944. PREPARATION OF GELATIN. IV. THE STABILITY OF THE VARIOUS TYPES OF GELATIN. EXTRACTION OF DEAMINIZED COLLAGEN. GENERAL DISCUSSION. Soc. Chem. Indus. Jour. 63: 303-306. C.A. 39: 1561.

(743) BECHHOLD, H. and NEUMANN, S.
1924. INVESTIGATIONS ON GLUE AND GELATIN. Ztschr. f. Angew. Chem. 37: 534-540. C.A. 18: 3489.

(744) BENNETT, H. G.
1918. THE SWELLING OF GELATIN. Amer. Leather Chem. Assoc. Jour. 13: 270-85. Also in: Soc. Leather Trades Chem. Jour. 2: 40-51-1918. C.A. 12: 2458.

(745) BERGMANN, M.
1935. COMPLEX SALTS OF AMINO ACIDS AND PEPTIDES. II. DETERMINATION OF L-PROLINE WITH AID OF RHODANILIC ACID. THE STRUCTURE OF GELATINE. Jour. Biol. Chem. 110: 471-479.

(746) -------- and NIEMANN, C.
1937. ON THE STRUCTURE OF PROTEINS; CATTLE HEMOGLOBIN, EGG ALBUMIN, CATTLE FIBRIN AND GELATIN. Jour. Biol. Chem. 118: 301-314.

(747) BERRÁR, M.
1912. CHEMISTRY AND QUANTITATIVE DETERMINATION OF GELATIN. Biochem. Ztschr. 47: 189-214. C.A. 7: 2767.

(748) BOGUE, R. H.
1922. CHEMISTRY AND TECHNOLOGY OF GELATIN AND GLUE. 640 pp. New York, McGraw.

(749) BRACONNOT, H.
1820. ON THE CONVERSION OF ANIMAL MATERIALS INTO NEW SUBSTANCES BY MEANS OF SULFURIC ACID. Ann. Chim. Phys. 13 (ser. 2) 113-125.

(750) COHN, E. J. and EDSALL, J. T.
1943. PROTEINS, AMINO ACIDS AND PEPTIDES. 686 pp. New York, Reinhold.

(751) COLLIN, R
1928. PROPERTIES OF FILAMENTS OF COAGULATED GELATIN. Soc. de Biol. Paris Compt. Rend. 98: 1353-1355. C.A. 22: 3180.

(752) DAKIN, H. D.
1920. AMINO ACIDS OF GELATIN. Jour. Biol. Chem. 44: 499-529.

(772) -------- DRÖSCHER, K. TH.
1940. MINERAL TANNING. XII. REACTION OF CHROME SALTS WITH GELATIN. Collegium: 106-121. C.A. 34: 8325.

(773) -------- --------
1940. MINERAL TANNING. XIII. REACTION OF COPPER AND CHROME SALTS WITH GELATIN AND GELATIN HYDROLYZATES. Collegium: 122-142. C.A. 34: 8325.

(774) -------- and KOEPFF, H.
1938. THE IMPORTANCE OF PRETREATMENT WITH LIME FOR THE CONVERSION OF COLLAGEN INTO GELATIN. Collegium: 433-458. C.A. 32: 9546.

(775) LIESEGANG, R. E.
1942. EFFECT OF HEAT ON GELATIN. Kolloid. Ztschr. 101: 272-273. C.A. 38: 2236.

(776) LLOYD, D. J.
1930. ABSORPTION OF WATER BY GELATIN. IV. THE INFLUENCE OF TEMPERATURE. Biochem. Jour. 24: 1460-1471.

(777) --------
1931. THE ABSORPTION OF WATER BY GELATIN. VI. THE INFLUENCE OF THE THICKNESS AND ORIGINAL CONCENTRATION OF THE GEL. Biochem. Jour. 25: 1580-1592.

(778) -------- and PLEASS, W. B.
1927. ABSORPTION OF WATER BY GELATIN. Pt. 1. Biochem. Jour. 21: 1352-1367.

(779) -------- --------
1928. ABSORPTION OF WATER BY GELATIN. Pt. 2. Biochem. Jour. 22: 1007-1018.

(780) MARDLES, E. W. J.
1924. PEPTISATION OF GELATIN BY MIXED LIQUIDS. Biochem. Jour. 18: 215-230.

(781) MIKHAILOV, V. N. and KASHINA, T. S.
1944. GLUEING RÉGIME WITH COLLAGEN GLUES. Lesnaya Prom. 9: 18-22. C.A. 39: 4252.

(782) NORTHROP, J. H.
1921. ROLE OF THE ACTIVITY COEFFICIENT OF THE HYDROGEN ION IN THE HYDROLYSIS OF GELATIN. Jour. Gen. Physiol. 3: 715-742. C.A. 15: 3853.

(762) GORDON, A. H., MARTIN, A. J. P. and SYNGE, R. L. M.
1943. A STUDY OF THE PARTIAL ACID HYDROLYSIS OF COW-HIDE GELATIN. Biochem. Jour. 37: 92-102.

(763) GRAHAM, T.
1861. LIQUID DIFFUSION APPLIED TO ANALYSIS. Phil. Trans. Roy. Soc. London 151: 183-224.

(764) GREIFENHAGEN, W., KÖNIG, J. and SCHOLL, A.
1911. ESTIMATION OF GELATIN. Biochem. Ztschr. 35: 217-227. C.A. 6: 2268.

(765) HOLLEMAN, L. W. J., JONG, H. G. B. DE, and MODDERMAN, R. S. T.
1934. LYOPHILIC COLLOIDS. XXIII. HEATS OF WETTING AND GELATIN. Kolloid Beihefte 40: 211-240. C.A. 29: 4993.

(766) JIRGENSONS, BR.
1942. EXPERIMENTS ON THE PRECIPITABILITY OF GELATIN. Biochem. Ztschr. 310: 325-334. C.A. 37: 4292.

(767) --------
1942. DETERMINATION OF THE MOLECULAR WEIGHT AND PARTICLE SHAPE OF SOME DEGRADATION PRODUCTS OF GELATIN BY PRECIPITATION TITRATION. Jour. Prakt Chem. 160: 21-32 C.A. 37: 4292.

(768) KOVAL, V.
1939. PRODUCTION OF GELATIN Myasnaya Ind. No. 8: 9-13. (Khim Referat Zhur. 1940 (1) 135). C.A. 36: 1519.

(769) KRÜGER, D.
1938. PROTEIN STRUCTURES (WOOL, FIBROIN, GELATIN). Chem. Ztg. 62: [illegible] C.A. [illegible]

(770) KÜNTZEL, A.
1929. STUDIES ON THE SWELLING OF GELATIN IN AQUEOUS SOLUTIONS OF ACIDS, BASES AND SALTS AND OF MIXTURES OF THE SAME. Biochem. [illegible] C.A. 23: 5082.

(771) -------- and BOENSEL, H.
1936. CONTRIBUTIONS TO THE THEORY OF MINERAL TANNAGE. V. THE ACTION OF CHROMIUM SALTS ON THE ABILITY TO MELT AND THE MUTAROTATION OF GELATIN GELS. Collegium: 576-588. JALCA 32: 396. C.A. 31: 3326

(793) STIASNY, E.
1924. **INFLUENCE OF NEUTRAL SALTS ON THE PROPERTIES OF GELATIN.** Kolloid Ztschr. 35: 353-358. C.A. 19: 1078.

(794) STEIGMANN, A.
1948. **REACTIONS TO ESTABLISH THE ORIGIN OF GELATINS.** Soc. Chem. Ind. Jour. 62: 206-208. C.A. 38: 1659.

(795) THAN, F.
1933. **ON THE DETERMINATION OF THE GELATIN CONTENT OF VARIOUS TYPES OF MEAT.** Biochem. Ztschr. 264: 367-370. B.A. 10: 15690.

(796) WATANABE, K.
1944. **PHYSICAL PROPERTIES OF GELATIN FROM THE CASE OF THE SPERM WHALE.** Agr. Chem. Soc. Japan. Jour. 20: 193-194. C.A. 41: 4373.

K. ELASTIN AND RETICULIN

(797) FAURÉ-FREMIET, E.
1936. **ELASTIC PROPERTIES OF ELASTIN.** Jour. de Chim. Phys. 33: 681-694. C.A. 31: 925.

(798) --------
1937. **THERMAL TRANSFORMATION OF ELASTIN.** Jour. de Chim. Phys. 34: 125-135. C.A. 31: 5655.

(799) -------- and WOELFFLIN, R.
1936. **REARRANGEMENT TEMPERATURE OF ELASTIN.** Jour. de Chim. Phys. 33: 801-814. C.A. 31: 2069.

(800) -------- and WOELFFLIN, R.
1936. **ABSORPTION OF WATER BY ELASTIN.** Jour. de Chim. Phys. 33: 666-680. C.A. 31: 925.

(801) -------- --------
1936. **TITRATION CURVE OF ELASTIN.** Jour. de Chim. Phys. 33: 695-700. C.A. 31: 925.

(802) NAGEOTTE, J. and GUYON, L.
1930. **RETICULIN.** Amer. Jour. Path. 6: 631-653.

(783) --------
1930. ABSORPTION OF WATER BY GELATIN. III. THE SULPHATE SYSTEM. Biochem. Jour. 23: 358-372.

(784) PLEASS, W. B.
1930. ABSORPTION OF WATER BY GELATIN. V. INFLUENCE OF CALCIUM HYDROXIDE. Biochem. Jour. 24: 1472-1478.

(785) PROCTER, H. R.
1914. EQUILIBRIUM OF DILUTE HCl AND GELATIN. Chem. Soc. London Jour. 105: 313-327.

(786) -------- and WILSON, J. A.
1916. ACID-GELATIN EQUILIBRIUM. Chem. Soc. London 109: 307-319.

(787) ROUSSELOT, A.
1943. NEW METHOD FOR THE DEMINERALIZATION OF GELATINS. Acad. des Sci. Paris Compt. Rend. 216: 54-56. C.A. 38: 5428.

(788) SCATCHARD, G., ONCLAY, J. L., WILLIAMS, J. W., and BROWN, A.
1944. SIZE DISTRIBUTION IN GELATIN SOLUTIONS. PRELIMINARY REPORT. Amer. Chem. Soc. Jour. 66: 1980-1981. C.A. 39: 660.

(789) SHEPPARD, S. E. and HOUCK, R. C.
1930. THE STRUCTURE OF GELATIN SOLS AND GELS. I. THE VISCOSITY OF GELATIN SOLUTIONS. Jour. Phys. Chem. 34: 273-298. C.A. 24: 1783.

(790) -------- --------
1932. THE STRUCTURE OF GELATIN SOLS AND GELS. V. THE INSOLUBILIZATION OF GELATIN BY HEAT. Jour. Phys. Chem. 36: 2885-2900. C.A. 27: 650.

(791) -------- and McNALLY, J. G.
1930. STRUCTURE OF GELATIN SOLS AND GELS. Colloid Symposium Annual 7: 17-39. C.A. 24: 1783.

(792) SMITH, P. I.
1943. GLUE AND GELATIN. 145 pp. New York Chem. Pub. Co.

(812) --------, BOLLING, D., BRAND, F. C. and SCHEIN, A.
1939. THE COMPOSITION OF KERATINS. THE AMINO ACID COMPOSITION OF HAIR, WOOL, HORN AND OTHER EUKERATINE. Jour. Biol. Chem. 128: 181-186.

(813) BULL, H. B.
1944. ABSORPTION OF WATER VAPOR BY PROTEINS. Amer. Chem. Soc. Jour. 66: 1499-1507.

(814) COTTON-FEYTIS, E. and FAURE-FREMIET, E.
1942. MAGNETIC ANISOTROPY OF CERTAIN ORGANIC SUBSTANCES WITH A FIBROUS STRUCTURE cad. des Sci. Paris Compt. Rend. 214: 996-998. C.A. 39: 231.

(815) DELORME, J.
1938. GENERAL PROPERTIES OF ALBUMINOIDS. Rev. Gen. Mat. Plastiques 14: 187-192, 226-229, 254-258 et seq. C.A. 33: 660.

(816) DERKSEN, J. C., HERINGA, G. C. and WEIDINGER, A.
1937. ON KERATIN AND CORNIFICATION. Acta Neerland. Morph. 1: 31-37.

(817) GORDON, A. H., MARTIN, A. J. P. and SYNGE, R. L. M.
1943. PARTITION CHROMATOGRAPHY IN THE STUDY OF PROTEIN CONSTITUENTS. Biochem. Jour. 37. 79-86.

(818) -------- -------- --------
1943. AMINE-ACID COMPOSITION OF GRAMICIDIN. Biochem. Jour. 37: 86-92.

(819) GRASSMANN, W.
1939. PROTEIN FIBERS Att. 7e Congr. Intern. Chim. 4: 753-754. C.A. 34: 3146.

(820) -------- HANDBUCH DER GERBEREICHEMIE UND LEDERFABRIKATION. V.1,PT.1, DIE HAUT.
1940. (HANDBOOK OF TANNING CHEMISTRY AND LEATHER MANUFACTURE. Vol. 1, pt. 1. The Skin.) 1104 pages. Wien. Springer-Verlag.

(821) GREENBERG, D. M. and LARSON, C. E.
1935. PHYSICAL CHEMISTRY OF THE PROTEINS IN NON-AQUEOUS AND MIXED SOLVENTS. II. ELECTROCHEMICAL PROPERTIES OF PROTEIN SOLUTIONS IN CERTAIN GLACIAL ORGANIC ACIDS. Jour. Phys. Chem. 39: 665-77.

(803) RODDY, W. T. and O'FLAHERTY, F.
1938. SOME NOTES ON THE ELASTIC TISSUE OF CALF SKIN DURING THE MANUFACTURE OF CHROME LEATHER. Amer. Leather Chem. Assoc. Jour. 33: 512-525. C.A. 33: 427.

(804) -------- --------
1939. BEHAVIOR OF RETICULAR TISSUE OF ANIMAL SKIN. Amer. Leather Chem. Assoc. Jour. 34: 671-687. C.A. 34: 2202.

(805) SCHNEIDER, J. and HÁJEK, A.
1928. A NEW METHOD FOR ESTIMATING THE DIGESTIVE ACTION OF ENZYMES ACCORDING TO THE EFFECT ON ELASTIN. Biochem. Ztschr. 195: 403-414. C.A. 22: 1558.

(806) STEIN, W. H. and MILLER, E. G., JR.
1938. COMPOSITION OF ELASTIN. Jour. Biol. Chem. 125: 599-614.

L. PROTEINS AND TOPICS RELATED TO COLLAGEN STUDY

(807) ALEXANDER, J.
1933. ALBUMINOIDS OR SCLEROPROTEINS. *In:* Allen's Commercial Organic Analysis. Ed. 5. V. 10: 119-196.

(808) --------
1928-46. COLLOID CHEMISTRY. V. 2-6. New York Chemical Catalog Co. (See indexes to each volume for references on collagen).

(809) BERGMANN, M. and NIEMANN, C.
1936. ON BLOOD FIBRIN. A CONTRIBUTION TO THE PROBLEM OF PROTEIN STRUCTURE. Jour. Biol. Chem. 115: 77-85.

(810) BLOCK, R. J. and BOLLING, D.
1939. THE AMINO ACID COMPOSITION OF KERATINS. THE COMPOSITION OF GORGONIN, SPONGIN, TURTLE SCUTES, AND OTHER KERATINS. Jour. Biol. Chem. 127: 685-693.

(811) -------- and HORWITT, M. K.
1937. THE BASIC AMINO ACIDS OF KERATINS. NOTE ON THE BASIC AMINO ACID CONTENT OF PORCUPINE QUILLS AND ECHIDNA SPINES. Jour. Biol. Chem. 121: 99-100.

(832) ISHIDATE, M. and SAKAGUCHI, T.
1942. DETECTION OF NATURAL PROTEIN WITH pH INDICATOR. Chem. Soc. Japan Bul. 17: 225-228. C.A. 41: 4533.

(833) LIEBEN, F. and TANDLER, R.
1937. EFFECT OF BROMINE ON PROTEINS. Biochem. Ztschr. 292: 82-91. C.A. 31: 7903.

(834) LILLIE, R. S.
1907. INFLUENCE OF ELECTROLYTES AND OF OTHER CONDITIONS ON THE OSMOTIC PRESSURE OF COLLOIDS. Amer. Jour. Physiol. 20: 127-169. Chem. Soc. Lond. Jour. Abstr. v. 92: II: 847.

(835) LLOYD, D. J.
1926. CHEMISTRY OF PROTEINS AND ITS ECONOMIC APPLICATIONS. 279 pp. London, Churchill. *For Pr. 2,* see Lloyd, D. J. and Shore, Agnes.

(836) --------
1933. COMBINATION OF PROTEINS WITH ACIDS AND BASES. Internatl. Soc. Leather Trades Chem. Jour. 17: 245-258. C.A. 27: 3131.

(837) --------
1935. THE PROTEINS AS COLLOIDAL ELECTROLYTES. Faraday Soc. Trans. 31: 317-324.

(838) -------- and BIDDER, P. B.
1935. TITRATION CURVES OF PROTEIN FIBERS. Faraday Soc. Trans. 31: 864-868. C.A. 29: 5720.

(839) -------- and GARROD, M.
1946. THE RUBBERLIKE CONDITIONS OF THE FIBERS OF ANIMAL SKIN. Soc. Dyers Colourists, Symposium on Fibrous proteins, 1946: 24-26. C.A. 41: 144[illegible].

(840) -------- and MARRIOTT, R. H.
1933. THE SWELLING OF PROTEIN FIBRES. PT. II. SILK GUT. Faraday Soc. Trans. 29: 1228-1240.

(841) -------- --------
1934. THE SWELLING OF PROTEIN FIBRES. PT. III. HORSEHAIR. Faraday Soc. Trans. 30: 944-958.

(822) GUSTAVSON, K. H.
1942. THE INFLUENCE OF THE PROTEIN ORGANIZATION ON ITS REACTIVITY. Svensk Kem. Tidskr. 54: 74-83. C.A. 38: 2352. C.Z. 1942 II: 2797-8.

(823) --------
1942. STUDIES ON THE NATURE OF PROTEIN DENATURATION BY TEST OF THE REACTIVITY OF SOME NATIVE AND HEAT-DENATURED PROTEINS. Biochem. Ztschr. 311: 347-373. C.A. 37: 2752.

(824) HARRISON, W.
1937. THE KERATIN FIBRES. Chem. and Indus. 56: 731-735.

(825) --------
1937. STRUCTURE OF KERATIN FIBRES. Textile Inst. Jour. 28: 110-112P.

(826) HERMANS, P. H.
1941. MECHANISM OF DEFORMATION AND SWELLING OF CELLULOSE GELS. Kolloid Ztschr. 96: 311-326. C.A. 36: 7303.

(827) HERZOG, R. O.
1928. SCLEROPROTEINS. Helvetica Chim. Acta. 11: 529-533. C.A. 22: 2955.

(828) --------
1928. REMARKS ON O. GERNGROSS' ARTICLE ON THE "CHEMISTRY OF THE PROTEINS". Ztschr. f. Angew. Chem. 41: 426. C.A. 23: 2732.

(829) HÖBER, R.
1945. PHYSICAL CHEMISTRY OF CELLS AND TISSUES. p. 296, Chapt. 16, London, Churchill (676 pp.)

(830) HUMPHREY, J. H.
1946. STUDIES ON DIFFUSING FACTORS. 1. THE KINETICS OF THE ACTION OF HYALURONIDASE FROM VARIOUS SOURCES UPON HYALURONIC ACID, WITH A NOTE UPON ANOMALIES ENCOUNTERED IN THE ESTIMATION OF N-ACETYL GLUCOSAMINE. Biochem. Jour. 40: 435-441.

(831) --------
1946. STUDIES ON DIFFUSING FACTORS. 2. THE ACTION OF HYALURONIDASE PREPARATIONS FROM VARIOUS SOURCES UPON SOME SUBSTRATES OTHER THAN HYALURONIC ACID. Biochem. Jour. 40: 442-445.

(853) MÜLLER, J.
1837. ON CARTILAGE AND BONE. Pogg. Annal. 38: 295-337. Abstract or reprint in Ann. Der Pharm. 21: 277-282.

(854) MULLIN, C. E. and HUNTER, H. L.
1931. CHEMICAL CONSTITUTION OF WOOL AND SILK. II. PROTEINS IN GENERAL AND WOOL AND SILK IN PARTICULAR. Textile Colorist 53: 599-603. C.A. 25: 5995.

(855) NAGEOTTE, J.
1931. VARIATIONS IN SIGN OF DOUBLE REFRACTION IN MYELINI AND SIMILAR FIGURES. Acad. des Sci. Paris Compt. Rend. 192: 584-586.

(856) --------
1933. METAMORPHISM (OF PROTEINS). Soc. de Biol. Paris Compt. Rend. 122: 1279-1282. C.A. 27: 2970.

(857) NILSSEN, B.
1938. STRUCTURE OF KERATIN. Tids. Kjemi Bergvesen 18: 2-7. C.A. 32: 9507.

(858) NUTTING, G. C., HALWER, M., COPLEY, M. J., and SENTI, F. R.
1946. RELATIONSHIP BETWEEN MOLECULAR CONFIGURATION AND TENSILE PROPERTIES OF PROTEIN FIBERS. Textile Res. Jour. 15: 599-608.

(859) PAULING, L.
1940. A THEORY OF THE STRUCTURE AND PROCESS OF FORMATION OF ANTIBODIES. Amer. Chem. Soc. Jour. 62: 2643-2657.

(860) PLIMMER, R. H. A.
1924. ANALYSIS OF PROTEINS. II. ACTION OF NITROUS ACID UPON HEXONE BASES. Biochem. Jour. 18: 105-109.

(861) REED, H. C.
1922. VERSATILITY OF PLUMPING METHOD. Amer. Leather Chem. Assoc. Jour. 17: 460-482.

(862) REZNICHENKO, M. S.
1938. MOST RECENT PROGRESS IN THE STRUCTURE CHEMISTRY OF PROTEIN. Uspekhi Khim. 7: 538-558. C.A. 33: 5013.

(863) RIMINGTON, C.
1931. THE CARBOHYDRATE COMPLEX OF THE SERUM PROTEINS. II. IMPROVED METHOD FOR ISOLATION AND REDETERMINING OF STRUCTURE, ISOLATION OF GLUCOSANUNODIMANNOSE FROM PROTEINS OF OX BLOOD. Biochem. Jour. 25: 1062-1071.

(842) -------- and PHILLIPS, H.
1933. PROTEIN STRUCTURE AND PROTEIN HYDRATION. Faraday Soc. Trans. 29: 132-148.

(843) -------- and SHORE, A.
1938. CHEMISTRY OF THE PROTEINS. Ed. 2. 532 pp. Philadelphia, Blakiston.

(844) --------, DEMPSEY, M., and GARROD, M.
1946. THE SWELLING OF PROTEIN FIBRES IN ORGANIC SOLVENTS. Faraday Soc. Trans. Vol. 42B. 228-244.

(845) LOEB, J.
1924. PROTEINS AND THE THEORY OF COLLOIDAL BEHAVIOR. Ed. 2. 380 pp. New York, McGraw.

(846) LOISELEUR, J.
1929. THE MODIFICATION OF COLLOIDS BY THE ACTION OF THE RAYS FROM RADIO-ACTIVE SUBSTANCES. Acad. des Sci. Paris Compt. Rend. 188: 1570-1572. C.A. 23: 4618.

(847) MARKLEY, K. S.
1945. INDUSTRIAL PROTEINS. Karl Freudenberg. F.I.A.T. 365, Off. Military Govt. for Germany (U. S.) Field Information Agency, Technical. 8 pp. (also issued as PB 1317). Abstr. in Soc. Dyers and Colourists Jour. 62: 387. 1946.

(848) MERRILL, H. B.
1924. THE HYDROLYSIS OF SKIN AND HAIR. Indus. Engin. Chem. 16: 1144-1146.

(849) --------
1925. THE EFFECT OF SULFIDES ON THE ALKALINE HYDROLYSIS OF SKIN AND HAIR. Indus. Engin. Chem. 17: 36-39.

(850) MORSE, W.
1933. CHEMISTRY OF THE INTEGUMENT. V. A NEW COLOR REACTION FOR HYDROXYPROLINE AND ITS USE IN DISTINGUISHING THE SCLEROPROTEINS. Jour. Biol. Chem. 100: 373-377. C.A. 27: 2705.

(851) MULDER, G. J.
1837. ON THE COMPOSITION OF CHONDRINS. Natuur en Schiekundig Archief. 1837: 450-457. C.Z. 1838 I: 499-500.

(852) --------
1838. COMPOSITION OF CHONDRINS. Bulletin de Sciences Phys. et Natur. de Neerlande Ann. 1838: 37. Abstract or reprint in, Ann. der Pharm. 28: 328-330.

(875) SMORODINTZEV, I. A. and PAVLOV, S. A.
1937. MECHANISM OF THE ACTION OF NEUTRAL SALTS ON PROTEINS. II. Soc. de Chim. Biol. Bul. 19: 1339-1342. Also in, Jour. Gen. Chem. (USSR) 7: 2461-2463. C.A. 32: 961.

(876) -------- --------
1937. MECHANISM OF THE ACTION OF NEUTRAL SALTS ON PROTEINS. Soc. de Chim. Biol. Bul. 19: 915-921. Also in, Jour. Gen. Chem. (USSR) 7: 1982-1985. C.A. 31: 7897.

(877) SOKOLOV, S. I.
1937. STRUCTURE AND MECHANICAL PROPERTIES OF THE GELS AND FIBERS FORMED BY HIGH MOLECULAR SUBST NCES. Akad. Nauk. S.S.S.R. Izv. (Acad des Sci. U.R.S.S. Bul.) Classe Sci. Nat. Nat. Ser. Chim. 1187-1514. C.A. 32: 5681.

(878) SPEAKMAN, J. B.
1936. THE REACTIVITY OF THE SULFUR LINKAGE IN ANIMAL FIBERS. I. THE CHEMICAL MECHANISM OF PERMANENT SET. Soc. Dyers and Colourists Jour. 52: 335-346. C.A. 30: 8629. Also in Text. Inst. J. 27: 231-243P, 1936.

(879) --------
1936. THE REACTIVITY OF THE SULFUR LINKAGE IN ANIMAL FIBERS. III. METHODS FOR REALIZING A PERMANENT SET AT LOW TEMPERATURES. Soc. Dyers and Colourists. Jour. 52: 423-429. C.A. 31: 262.

(880) --------
1947. MECHANOCHEMICAL METHODS FOR USE WITH ANIMAL FIBERS. Textile Inst. Jour. 38: T102-T126. C.A. 41: 3970.

(881) -------- and STOTT, E.
1934. TITRATION CURVE OF WOOL KERATIN. Faraday Soc. Trans 30: 539-548.

(882) -------- --------
1938. CONSTITUTION OF THE KERATIN MOLECULE. Nature 141: 414.

(883) -------- and STOVES, J. L.
1937. REACTIVITY OF THE SULFUR LINKAGE IN ANIMAL FIBERS. IV. THE FORMATION OF -CH=N-LINKAGES IN SETTING PROCESSES. Soc. Dyers and Colourists Jour. 53: 236-242. C.A. 31: 6011.

(884) -------- and TOWNEND, F.
1936. TITRATION CURVE OF FEATHER KERATIN. Faraday Soc. Trans. 32: 897-902.

(864) ROGERS, H. J.
1946. THE INFLUENCE OF HYDROLYZATES OF HYALURONATE UPON HYALURONIDASE PRODUCTION BY MICRO-ORGANISMS. Biochem. Jour. 40: 583-588.

(865) SADIKOV, V. S.
1906. INVESTIGATIONS ON ANIMAL GLUE SUBSTANCES.. V. NOTE ON THE METHOD FOR THE PREPARATION OF GLUE SUBSTANCES. Hoppe-Seylers Ztschr. f. Physicl. Chem. 48: 130-139.

(866) --------
1907. THIOGLUTIN. Jour. Russ. Phys. Chem. Soc. 39: 411-422. B.C.A. 1907: 740.

(867) --------
1907. ON THIOGLUTIN. Ztschr. f. Chem. u. Indus. der Kolloide. 1: 193-200. C.Z. 1907 1: 437-438.

(868) --------
1909. ON THE BEHAVIOR OF KOLLAINE OR GLUE SUBSTANCES TOWARD CARBON-DISULFIDE. Jour. Russ. Phys.-Chem. Soc. 41: 1597-1686. B.C.A. 1910: 211.

(869) SALLE, A. J. and GINOZA, Y. W.
1943. EFFECT OF CERTAIN ORGANIC COMPOUNDS ON THE GERMICIDAL EFFICIENCY OF MERCURIC CHLORIDE. Soc. for Expt. Biol. and Med. Proc. 54: 85-87. B.A. 18: 3030.

(870) SCHERER, J.
1841. CHEMICAL-PHYSIOLOGICAL INVESTIGATIONS. Ann. der Pharm. 40: 1-64.

(871) SCHRÖDER, G. D.
1843. ON CHLOR-CHORIDRIN. Ann. der Pharm. 45: 52-55.

(872) SCHULTZE, M.
1861. ON THE ARTIFICIAL TRANSFORMATION OF CHONDROGEN CARTILAGE TO COLLAGEN. Journak fur praktische chemie Ser. 1: 82-83: 162-171.

(873) SHURAVLIEV, D. and ARBUSOV, D.
1926. SPECIFIC GRAVITY OF VEGETABLE TANNINS AND OF THE SKIN. Vestnik (Organ of the All-Russian Leather Syndicate No. 12: 41). Also in, Collegium 1928: 44-45. C.A. 22: 2483.

(874) SMITH, E. C. BATE
1934. SCHEME FOR THE APPROXIMATE DETERMINATION OF THE PROTEINS OF MUSCLE. Soc. Chem. Ind. Jour. 53: 351-354 T. C.A. 29: 1118.

SECTION IV. SUPPLEMENTARY

LIST OF REFERENCES (1947 TO SEPTEMBER 1949)

(891) ABERCROMBIE, M. and JOHNSON, M. L.
1947. THE EFFECT OF REINNERVATION ON COLLAGEN FORMATION IN DEGENERATING SCIATIC NERVES OF RABBITS. Jour. Neurol., Neurosurg., Psychiat. 10: 89-92. C.A. 42: 3834.

(892) ASTBURY, W. T.
1947. ON THE STRUCTURE OF BIOLOGICAL FIBERS AND THE PROBLEM OF MUSCLE. Royal Society. London. Proc. Ser. B. 134: 303-328.

(893) ATKIN, W. R. and BURTON, D.
1949. THE EFFECT OF VEGETABLE TANNING ON THE COHESION OF COLLAGEN. Soc. Leather Trades' Chem. Jour. 33: 271-284.

(894) AXELROD, D. J.
1947. AN IMPROVED METHOD FOR CUTTING UNDECALCIFIED BONE SECTION AND ITS APPLICATION TO RADIO-AUTOGRAPHY. Anat. Rec. 98: 19-24.

(895) -------- and HAMILTON, J. G.
1947. RADIO-AUTOGRAPHIC STUDIES OF THE DISTRIBUTION OF LEWISITE AND MUSTARD GAS IN SKIN AND EYE TISSUES. Amer. Jour. Path. 23: 389-411. 1947.

(896) BAEHR, G. and POLLACK, A. D.
1947. DISSEMINATED LUPUS ERYTHEMATOSUS AND DIFFUSE SCLERODERMA. Amer. Med. Assoc. Jour. 134: 1169 1174.

(897) BALLE, M. P.
1948. RECENT DEVELOPMENTS IN THE CONTROL OF VEGETABLE-TANNING PROCESSES. Soc. Leather Trades Chem. Jour. 32: 39-55.

(898) BERG, J. L. and PUND, E. R., SYDENSTRICKER, V. P. et al.
1947. THE FORMATION OF CAPILLARIES AND OTHER TISSUE CHANGES IN THE CORNEA OF THE METHIONINE DEFICIENT RAT. Jour. of Nutrition 33: 271-28[illegible].

(899) BIDWELL, E., VAN HEYNINGEN, W. E. and CHARLWOOD, P. A.
1948. BIOCHEMISTRY OF THE GAS GANGRINE TOXINS. V. K-TOXIN (COLLAGENASE OF CLOSTRIDIUM WELCHII). Biochem. Jour. 42: 140-151.

(900) BOWES, J. H.
1949. RECENT STUDIES IN THE CHEMISTRY OF THE LIMING PROCESS. Soc, Leather Trades' Chem. Jour. 33: 176-190.

(885) -------- --------
1937. CONSTITUTION OF THE KERATIN MOLECULE. Nature 139: 411-412.

(886) -------- and WHEWELL, C. S.
1936. THE REACTIVITY OF THE SULFUR LINKAGE IN ANIMAL FIBERS. II. THE ACTION OF BARYTA AND CAUSTIC SODA ON HUMAN HAIR. Soc. Dyers and Colourists Jour. 52: 380-388. C.A. 31: 262.

(887) TADOKORO, T.
1930. SEX DIFFERENCES FROM THE STANDPOINT OF BIOCHEMISTRY. I. Hokkaido Imp. Univ. Faculty Sci. Jour. Ser. C. 1: 1-179. C.A. 26: 1020.

(888) VOGEL
1841. CONTRIBUTION TO THE KNOWLEDGE OF CHONDRINS. Journal fur praktische chemie. Ser. 1: 21: 426-430.

(889) WRINCH, D. M.
1938. IS THERE A PROTEIN FABRIC? Cold Spring Harbor Symposia on Quantitative Biology v. 6: 122-139.

(890) YENSEN, M. M.
1946. THE ACTION OF PEPSIN AND TRYPSIN ON PROTEINS HEATED IN FAT OR OIL. Instanbul. Univ. Faculte Med. Bul. 9: 166-171. (In Turkish) C.A. 41: 1046a.

(912) CRESSWELL, A. (To Amer. Cyanamid Co.)
1949. METHOD OF SPINNING COLLAGEN SOLUTIONS. U. S. Pat. 2,475,129. C.A. 43: 7248d.

(913) --------
1949. TREATMENT OF COLLAGEN STRANDS. U. S. Pat. 2,475.697. C.A. 43: 7248e.

(914) DAVIS, S. and MCLAREN, A. D.
1948. FREE ENERGY, HEAT, AND ENTROPY CHANGES ACCOMPANYING THE SORPTION OF WATER VAPOR BY PROTEINS. Jour. Polymer Sci. 3: 16-21. C.A. 42: 3239.

(915) DAY, T. D.
1947. MEMBRANOUS NATURE OF INTERSTITIAL CONNECTIVE TISSUE. Lancet, II: 945.

(916) --------
1947. THE NATURE AND SIGNIFICANCE OF CEMENTING SUBSTANCE IN INTERSTITIAL CONNECTIVE TISSUE. Jour. Path. and Bact. 59: 567-573.

(917) --------
1947. CONNECTIVE TISSUE CEMENTING SUBSTANCE. Nature 159: 100-101.

(918) --------
1948. INFLUENCE OF HYDROGEN IONS AND NEUTRAL SALTS UPON THE HYDRATION OF INTERSTITIAL CONNECTIVE TISSUE. Nature 162: 152-153.

(919) --------
1948. THE SPREAD OF FLUIDS IN CONNECTIVE TISSUE. Jour. of Path. and Bact. Vol. 60: p. 150-151.

(920) DEMPSEY, M. and GORROD, M. E.
1947. SYMPOSIUM ON BIOLOGICAL PROBLEMS OF THE LEATHER INDUSTRY. PROBLEMS ASSOCIATED WITH COLLAGEN, RETICULIN, AND ELASTIN IN THE SKIN. Ann. Appl. Biol. 34: 435-437. C.A. 42: 2795a.

(921) DRIBBEN, I. S. and WOLFE, J. M.
1947. STRUCTURAL CHANGES IN CONNECTIVE TISSUE OF ADRENAL GLANDS OF FEMALE RATS ASSOCIATED WITH OLD AGE. Anat. Rec. 98: 557-585.

(922) DUKE, K. L.
1947. THE FIBROUS CONNECTIVE TISSUE OF THE RABBIT OVARY FROM SEX DIFFERENTATION TO MATURITY. Anat. Rec. 98: 507-526.

(901) -------- and KENTEN, R. H.
1947. UPTAKE OF WATER BY COLLAGEN IN SOLUTIONS OF ALKALIS AND STRONG AND WEAK ORGANIC BASES. Nature 160: 827. C.A. 42: 2654.

(902) -------- --------
1947. SUMMARY OF PUBLISHED RESULTS (1900-1946) ON AMINO ACID COMPOSITION OF GELATIN AND COLLAGEN. See B.L.M.R.A. Laboratory Reports 1947, 26: 1. "The Amino Acid Composition of Collagen." (British Leather Manufacturers' Research Assoc. 1-6, Nelson Square, London, S. E. 1.)

(903) -------- --------
1948. THE AMINO-ACID COMPOSITION AND TITRATION CURVE OF COLLAGEN. Biochem. Jour. 42: 378-385.

(904) -------- --------
1948. THE EFFECT OF ALKALIS ON COLLAGEN. Biochem. Jour. 43: 365-372.

(905) -------- --------
1949. EFFECT OF DEAMINATION AND ESTERIFICATION ON THE REACTIVITY OF COLLAGEN. Biochem. J. 44: 142-155. C.A. 43: 6258f.

(906) CASSEL, J. M. and KANAGY, J. R.
1949. ELECTROPHORESIS OF MODIFIED COLLAGEN. Amer, Leather Chem. Assoc. Jour. 44: 442-459.

(907) -------- --------
1949. STUDIES ON THE PURIFICATION OF COLLAGEN. Amer. Leather Chem. Assoc. Jour. 44: 424-441.

(908) COMPTON, E. D.
1949. EFFECT OF TANNAGE ON STRENGTH OF COLLAGEN FIBERS. Amer. Leather Chem. Assoc. Jour. 49: 147-151. C.A. 43: 7246g.

(909) CONSDEN, R.
1948. PARTITION CHROMATOGRAPHY ON PAPER, ITS SCOPE AND APPLICATION. Nature. 162: 759-761.

(910) COSSLETT, V. E.
1949. SUMMARIZED PROCEEDINGS OF CONFERENCE ON ELECTRON MICROSCOPY. Cambr. Exp't. 1948. Jour. Sci. Instruments 26: 163-169. Eng.

(911) COWLEY, L. L. and BRUSH, B. E.
1947. TANTALUM OXIDE AND WOUND HEALING; EXPERIMENTAL STUDY. Proc. Soc. Exp't. Biol. and Med. 65: 60-61.

(934) GUSTAVSON, K. H.
1947. **THE ACTION OF GLYOXAL ON HIDE PROTEIN.** Svensk. Kem. Tidskr. 59: 98-102. C.A. 41: 7792.

(935) --------
1947. **THE EFFECT OF VEGETABLE TANNAGE ON THE ACID-COMBINING CAPACITY OF HIDE PROTEIN.** Amer. Leather Chem. Assoc. Jour. 42: 313-329.

(936) --------
1947. **EFFECT OF HYDROTHERMAL DENATURATION OF COLLAGEN UPON ITS REACTIVE GROUPS.** Acta. Chem. Scand. 1: 581-591. C.A. 42: 6562h.

(937) --------
1947. **THE PROBLEM OF EQUILIBRIUM IN CHROME FIXATION BY COLLAGEN.** Internatl. Soc. Leather Trades Chem. Jour. 31: 181-186.

(938) --------
1947. **THE SOLUBILIZATION OF NATIVE BOVINE HIDE COLLAGEN HAVING UNDERGONE TRYPTIC PRETREATMENT.** Internatl. Soc. Leather Trades Chem. Jour. 31: 362-366.

(939) --------
1947. **REACTION OF FORMALDEHYDE WITH COLLAGEN.** Jour. Biol. Chem. 169: 531-537.

(940) --------
1948. **REACTION OF LIGNOSULFONIC ACID WITH COLLAGEN. A NOTE.** Soc. Leather Trades Chem. Jour. 32: 287-8.

(941) --------
1948. **THE STRUCTURAL STABILITY OF FORMALDEHYDE TANNED COLLAGEN FIBERS.** Amer. Leather Chem. Assoc. Jour. 43: 741-744.

(942) --------
1948. **THE FAILURE OF FORMALDEHYDE FIXED BY GUANIDYL GROUPS TO EFFECT HYDROTHERMAL STABILIZATION OF COLLAGEN.** Amer. Leather Chem. Assoc. Jour. 43: 744-749.

(943) --------
1949. **DEPILATORY ACTION OF UREA.** Soc. Leather Trades' Chem. Jour. 33: 162-164.

(923) FEITELBERG, S., and KAUNITZ, P. E.
1949. X-RAY DIFFRACTION STUDIES OF HUMAN CHORDAE TENDINEAE. Biochim. et Biophys. Acta 3: 155-160.

(924) FINDLAY, J. D. and YANG, S. H.
1948. CAPILLARY DISTRIBUTION IN COW SKIN. Nature 161: 1012-1013.

(925) FREY-WYSSLING, A.
1948. SUBMICROSCOPIC MORPHOLOGY OF PROTOPLASM AND ITS DERIVATIVES. New York, Elsevier. 255 pp.

(926) GESSLER, A. E., GREY, C. E.
1947. NOTES ON THE ELECTRON MICROSCOPY OF TISSUE SECTIONS - SUB-MICROSCOPIC SPHERICAL BODIES IN CARCINOMA. Exp. Med. and Surg. 5: 307-318.

(927) -------- -------- and McCARTY K.
1948. NOTES ON THE ELECTRON MICROSCOPY OF TISSUE SECTIONS. SUB-MICROSCOPIC SPHERICAL BODIES IN HUMAN CARCINOMA II. Exp. Med. and Surg. 6: 329-3[illegible].

(928) GRAHAM, C. E., WAITKOFF, H. K. and HIER, S. W.
1949. THE AMINO ACID CONTENT OF SOME SCLEROPROTEINS. Jour. Biol. Chem. 177: 529-532.

(929) GREEN, R. W.
1948. ADSORPTION OF WATER VAPOR ON COLLAGEN AND ELASTIN. Roy Soc. New Zealand. Trans. Proc. 77: 24-46. C.A. 42: 8046f.

(930) GREENHUT, I. T., SIRNY, R. J. and ELVEHJEM, C. A.
1948. THE LYSINE, METHIONINE AND THREONINE CONTENT OF MEATS. Jour. Nutr. 35: 689-701. C.A. 42: 6468.

(931) GROSS, J.
1948. ELECTRON MICROSCOPE STUDIES OF SODIUM HYALURONATE. Jour. Biol. Chem. 172: 511-514.

(932) --------
1949. THE STRUCTURE OF ELASTIC TISSUE AS STUDIED WITH THE ELECTRON MICROSCOPE. Jour. Expt. Med. 89: 699-708.

(933) -------- and SCHMITT, F. O.
1948. THE STRUCTURE OF HUMAN SKIN COLLAGEN AS STUDIED WITH THE ELECTRON MICROSCOPE. Jour. Expt. Med. 88: 555-568.

(955) KANAGY, J. R.
1947. ADSORPTION OF WATER VAPOR BY UNTANNED HIDE AND VARIOUS LEATHERS AT 100° F. U. S. Natl. Bur. Stand. Jour. Res. 38: 119-128, also in, Amer. Leather Chem. Assoc. Jour. 42: 98-117.

(956) KENDALL, J. I.
1947. MICROSCOPIC ANATOMY OF VERTEBRATES. Ed. 3, Phila. Lea. and Febinger. 354 pp.

(957) KIRST, W.
1947. CHEMICALLY ALTERED WOOL. THE ACTION OF ALIPHATIC DIAZO COMPOUNDS ON KERATIN AND COLLAGEN. Melliand. Textilber. 28: 169-171. C.A. 42: 8480.

(958) KLEMPERER, P.
1947. DISEASES OF COLLAGEN SYSTEM. N. Y. Acad. Med. Bul. 23: 581-588.

(959) KRATKY, O.
1947. NEW RESULTS ON THE X-RAY PATTERNS OF PROTEINS. Monatsh. für Chem. 77: 224-250. Festband Ernst Späth.

(960) --------
1948. LOW-ANGLE SCATTERING IN POLYMERS. Jour. Polymer Sci. 3: 195-215. C.A. 42: 4390-4391.

(961) KUTYANIN, G. I.
1948. THE CHARACTER OF THE BONDING OF TANNING MATERIALS FROM SULFITE-CELLULOSE EXTRACTS AND OF SYNTANS WITH COLLAGEN. Legkaya Prom. 8: No. 4: 22-24. C.A. 43: 6449.

(962) LENNOX, F. G.
1947. SHRINKAGE OF COLLAGEN. Biochem. Jour. (Biochem. Soc. Proc.) 41: XLVII.

(963) --------
1949. SHRINKAGE OF COLLAGEN. Biochem. et Biophys. Acta. 3: 170-187.

(964) LIGHTFOOT, L. H. and COLLIDGE, T. B.
1948. THE DISTRIBUTION OF COLLAGEN IN THE GUINEA PIG. Jour. Biol. Chem. 176: 477-484.

(965) LILLIE, R. D.
1947. RETICULUM STAINING WITH SCHIFF REAGENT AFTER OXIDATION BY ACIDIFIED SODIUM PERIODATE. Jour. Lab. and Clin. Med., 32: 910-912.

(944) ---------
1949. THE HYDROGEN BONDING OF DEHYDRIC PHENOLS ON COLLAGEN. Soc. Leather Trades Chem. Jour. 33: 256-263.

(945) --------
1949. A NEW APPROACH TO THE EVALUATION OF THE ACTION OF PROTEINASES ON COLLAGEN IN BATING. Amer. Leather Chem. Assoc. Jour. 44: 392-399.

(946) -------- and TOMLINSON, J.
1948. THE REACTION OF HIGH MOLECULAR LIGNO-SULFONIC ACID WITH COLLAGEN. Soc. Leather Trades Chemists Jour. 32: 165-175.

(947) HANKES, L. V., RIESEN, W. H., HENDERSON, L. M., and ELVEHJEM, C. A.
1948. LIBERATION OF AMINO ACIDS FROM RAW AND HEATED CASEIN BY ACID AND ENZYME HYDROLYSIS. Jour. Biol. Chem., 176: 467-476.

(948) HARTLEY, L. M. and HALL, J. L.
1949. RAPID DETERMINATION OF COLLAGEN IN BEEF BY WARING BLENDOR AND CENTRIFUGE TECHNIQUE. Food Research 14: 195-202.

(949) HIGHBERGER, J. H.
1947. THE STRUCTURAL STABILITY OF THE COLLAGEN FIBER IN RELATION TO THE MECHANISM OF TANNING. Amer. Leather Chem. Assoc. Jour. 42: 493-511. 1947.

(950) HORN, M. J., JONES, D. B. and BLUM, A. E.
1948. MICROBIOLOGICAL DETERMINATION OF ARGININE IN PROTEINS AND FOODS. Jour. Biol. Chem. 176: 59-63.

(951) -------- -------- --------
1949. MICROBIOLOGICAL DETERMINATION OF LEUCINE IN PROTEINS AND FOODS. Jour. Biol. Chem. 177: 697-701.

(952) HOUGH, A. T.
1949. THE TANNING PROPERTIES OF PHENOLFORMALDEHYDE WATER-SOLUBLE CONDENSATES. Soc. Leather Trades' Chem. Jour. 33: 284-299.

(953) JONES, W. M. and BAKER, R.
1948. ELECTRON MICROSCOPY OF THE SARCOLEMMIA. Nature 161: 1012.

(954) KAESBERG, P. and OTHERS
1948. USE OF THE DOUBLE CRYSTAL SPECTROMETER IN THE ANALYSIS OF BRAGG REFLECTIONS AT VERY SMALL ANGLES. Phys. Rev. 74: 71-73.

(977) PAGE, R. O.
1947. THE REACTION OF COLLAGEN AND WATTLE TANNIN IN ETHYL ACETATE SOLUTIONS. Internatl. Soc. Leather Trades Chem. Jour. 31: 338-344.

(978) PANKHURST, K. G. A.
1947. INCIPIENT SHRINKAGE OF COLLAGEN AND GELATIN. Nature: 159: 538.

(979) PIRIE, A.
1947. ACTION OF MUSTARD GAS ON OX CORNEA COLLAGEN. Biochem. Jour. 41: 185-190. C.A. 42: 677h.

(980) PARTRIDGE, S. M.
1948. THE CHEMISTRY OF CONNECTIVE TISSUE I. THE STATE OF COMBINATION OF CHONDROITIN SULFATE IN CARTILAGE. Biochem. Jour. 43: 387-397.

(981) PICKEN, L. E. R., PRYOR, M. G. M., and SWANN, N. M.
1947. ORIENTATION OF FIBRILS IN NATRUAL MEMBRANES. Nature 159: 434.

(982) PINCUS, P.
1947. PROTEOLYSIS OF CARTILAGE AND BONE (LOSS OF CALCIUM). Biochem. Jour. Proc. 41: XVII - XVIII.

(983) PRUDENT, INEZ
1947. COLLAGEN AND ELASTIN CONTENT OF FOUR BEEF MUSCLES AGED VARYING PERIODS OF TIME. Thesis Ph. D. Univ. of Iowa. Ames.

(984) REED, R. and RUDALL, K. M.
1948. ELECTRON MICROSCOPE STUDIES ON THE STRUCTURE OF EARTHWORM CUTICLES. Biochim. et Biophys. Acta. 2: 7-18.

(985) -------- --------
1948. ELECTRON MICROSCOPE STUDIES OF MUSCLE STRUCTURE. Biochim. et Biophys. Acta. 2: 19-26.

(986) RICHARDSON, K. C.
1949. CONTRACTILE TISSUES IN THE MAMMARY GLAND, WITH SPECIAL REFERENCE TO MYOEPITHELIUM IN THE GOAT. Royal Society. London. Proc. Ser. B. 136: 30-45.

(987) ROBERTSON, Wm. v. B., DALTON, A. J., and HESTON, W.
1947. EFFECTS OF AN ASCORBIC ACID DEFICIENCY ON TUMORS. Cancer Research 7: 712. C.A. 42: 7423.

(966) LLOYD, D. J. and GARROD, M.
1948. CONTRIBUTION TO THE THEORY OF STRUCTURE OF PROTEIN FIBERS WITH SPECIAL REFERENCE TO THE SO-CALLED THERMAL SHRINKAGE OF THE COLLAGEN FIBER. Faraday Soc. Trans. 44: 441-451.

(967) LOOFBOUROW, J. R., GOULD, B. S., and SIZER, I. W.
1949. STUDIES ON THE ULTRA-VIOLET ABSORPTION SPECTRA OF COLLAGEN. Archives of Biochem. 22: 406-411.

(968) MARDASHEV, S. R. and SEMINA, L. A.
1948. ARGINASE IN THE SKIN. Biokhimiya 13: 236-243. C.A. 42: 7806.

(969) MERRILL, H. B., CAMBERON, D. H., ELLISON, H. L., and WRIXTON, C. H.
1949. THE EQUILIBRIUM BETWEEN COLLAGEN AND VEGETABLE TANNIN IN AQUEOUS ORGANIC SOLVENTS. Amer. Leather Chem. Assoc. Jour. 44: 54-68.

(970) MONTAGNA, W.
1949. GLYCOGEN AND LIPIDS IN HUMAN CARTILAGE, WITH SOME CYTOCHEMICAL OBSERVATIONS ON THE CARTILAGE OF THE DOG, CAT, AND RABBIT. Anat. Record 103: 77-92.

(971) MOORE, S. and STEIN, W. H.
1948. PHOTOMETRIC NINHYDRIN METHOD FOR USE IN THE CHROMATOGRAPHY OF AMINO ACIDS. Jour. Biol. Chem. 176: 367-388.

(972) MORRIONE, T. G.
1947. QUANTITATIVE STUDY OF CONTENT OF COLLAGEN IN EXPERIMENTAL CIRRHOSIS. Jour. Expt. Med. 85: 217-226. C.A. 41: 2798.

(973) MOSSMAN, H. W. and NOER, H. R.
1947. A STUDY OF THE AMNION WITH THE ELECTRON MICROSCOPE. Anat. Rec. 97: 253-257.

(974) MURPHY, G. E. and SWIFT, H. F.
1949. INDUCTION OF CARDIAC LESIONS CLOSELY RESEMBLING THOSE OF RHEUMATIC FEVER, IN RABBITS FOLLOWING REPEATED SKIN INFECTIONS WITH GROUP A STREPTOCOCCI. Jour. Expt. Mechine. 89: 687-698.

(975) NUTTING, G. C. and BORASKY, R.
1948. ELECTRON MICROSCOPY OF COLLAGEN. Amer. Leather Chem. Assoc. Jour. 43: 96-110.

(976) OREKHOVICH, V. N., TUSTANOVSKII, A. A., OREKHOVICH, K. D., and PLOTINKOVA, N. E.
1948. THE PROCOLLAGEN OF HIDE. Biokhimiya 13: 53-60. C.A. 42: 7805c.

(998) VAN VLIMMEREN, P. J.
1947. **STUDIES IN CHROME-VEGETABLE TANNAGE.** Internatl. Soc. Leather Trades Chem. Jour. 31: 259-284.

(999) WEIR, C. E.
1948. **EFFECT OF TEMPERATURE ON THE VOLUME OF LEATHER AND COLLAGEN IN WATER.** U. S. Nat. Bur. Stand. Jour. Res. 41: 279-285.

(1000) WEIR, C. E.
1949. **EXPANSIVITY OF LEATHER AND COLLAGEN.** Amer. Leather Chem. Assoc. Jour. 44: 79-92.

(1001) --------
1949. **RATE OF SHRINKAGE OF TENDON COLLAGEN; HEAT, ENTROPY AND FREE ENERGY OF ACTIVATION OF THE SHRINKAGE OF UNTREATED TENDON; EFFECT OF ACID, SALT, PICKLE AND TANNAGE ON THE ACTIVATION OF TENDON COLLAGEN.** U. S. Nat. Bur. Stand. Jour. Res. 42: 17-32. Amer. Leather Chem. Assoc. Jour. 44: 108-140.

(1002) WOLPERS, C.
1948. **SHOULD HYDROGEN PEROXIDE BE USED FOR WOUND TREATMENT?** Arztl. Wchnschr., 3: 644-646.

(1003) --------
1948. **THE DISC AND LAMELLAR PHASE OF COLLAGEN STRIATIONS.** Die Macromolekulare Chemie 2: 37-47.

(1004) --------
1948. **COLLAGEN STRIATIONS AND HEAT SHRINKAGE.** Biochem. Ztschr. 318: 373-383.

(1005) --------
1948. **THE SARCOLEMNA.** Klini. Wchnschr. 26: 724-726.

(1006) WRIGHT, B. A.
1948. **LOW-ANGLE X-RAY DIFFRACTION PATTERN OF COLLAGEN.** Nature 162: 23. C.A. 42: 7353.

(1007) YUDITSKAYA, A. I.
1947. **THE CHEMICAL NATURE OF RETICULIN.** Biokhimiya 14: 97-101. C.A. 43: 6263a.

(1008) ZAIDES, A. L.
1947. **CHANGES IN SIZE OF COLLAGEN FIBERS AFTER TANNING.** Legkaya Prom. 1947, 170: 5-8. (Abstract in Soc. Leather Trades Chem. Jour. 32: 149, 1949).

(988) SCHMITT, F. O.
1949. SOME COMMENTARIES ON ELECTRON MICROSCOPY AS APPLIED IN BIOLOGY. Federation Proceedings 8: 556-577.

(989) -------- and GROSS, J.
1948. FURTHER PROGRESS IN THE ELECTRON MICROSCOPY OF COLLAGEN. Amer. Leather Chem. Assoc. Jour. 43: 655-675.

(990) SCOTT, D. B. and WYCOFF, R. W. G.
1947. SHADOWED REPLICAS OF GROUND SECTIONS THROUGH TEETH. U. S. Public Health Serv. Public Health Reports 62: 422-425.

(991) SENTI, F. R.
1947. STRUCTURE OF PROTEIN FIBERS. Amer. Dyestuff Reptr. 36: 230-237.

(992) SPIEGEL-ADOLF, M. and HENNY, G. C.
1947. X-RAY DIFFRACTION STUDIES IN BIOLOGY AND MEDICINE. New York, Grune and Stratton, 215 pp.

(993) STEIN, W. H. and MOORE, S.
1948. CHROMATOGRAPHY OF AMINO ACIDS ON STARCH COLUMNS. SEPARATION OF PHENYLALANINE, LEUCINE, ISOLEUCINE, METHIONINE, TYROSINE, AND VALINE. Jour. Biol. Chem. 176: 337-365.

(994) STUBBINGS, R. L. and THEIS, E. R.
1949. STUDIES IN ANIMAL SKIN PROTEINS VIII. Amer. Leather Chem. Assoc. Jour. 44: 176-188.

(995) STUBBINGS, R. L. and THEIS, E. R.
1949. STUDIES IN ANIMAL SKIN PROTEINS IX. LAYERWISE BASIC AND DICARBOXYLIC ACID CONTENT OF ANIMAL SKIN COLLAGEN. Soc. Leather Trades Chem. Jour. 33: 157-162.

(996) THEIS, E. R. and KLEPPINGER, C. T.
1947. STUDIES IN CHROME TANNAGE. XV. THE EFFECT OF FORMALDEHYDE PRE-TREATMENT UPON CHROME RETANNAGE AND OF CHROME PRETANNAGE UPON FORMALDEHYDE RETANNAGE. Amer. Leather Chem. Assoc. Jour. 42: 711-721.

(997) TOBIN, C. E. and RUMERY, R. E.
1948. A METHOD FOR STAINING COLLAGENOUS TISSUE IN GROSS ANATOMICAL SECTIONS. Anat. Rec. 101: 281-289.

Author	Reference
·ll, E. F.	283
·ll, E. L.	285
·ll, F. O.	218
nnett, H. B.	549,550,551
nnett, H. G.	744
nninghoff, A.	157
nsley, S. H.	158
ntley, F. H.	4
rg, J. L.	898
rger, E. E. F.	713
rgmann, M.	310,311,355,371,435,436,714,745,746,809
veridge, J. M. R.	356
rlin, M. I.	603
rrär, M.	747
zler, F. I.	379
dder, P. B.	338
dwell, E.	899
edermann, R.	409
erich, R.	107
ncer, H.	754
ackburn, S.	380
echman, H.	79
ock, R. J.	357,810,811,812
ockey, J. R.	494
oom, W.	78
um, A. E.	950,951
um, W. A.	621
Blumgart, H. L.	284
Boensel, H.	771
Bogue, R. H.	312,748
Bolling, D.	357,810,812
Borasky, R.	975
Botvinik, M. M.	358,393
Boulanger, H.	646
Bourne, G.	5
Bowes, J. H.	495,496,497,498,900,901,902,903,904,905
Braconnot, H.	749
Brand, F. C.	812
Brave, G. A.	381,382,383,384,385
Braybrooks, W. E.	313,552,647
Briggs, P. S.	648
Brown, A.	788
Brown, J. D.	287
Brush, B. E.	911
Bucheimer, K.	339
Bucher, R.	108
Buchkovskii, M. V.	260
Buerger, L.	314
Bulankin, I. N.	553
Bull, H. B.	813
Burns, E. L.	124
Burton, D.	893
Bussino, G.	531
Buzágh, A.	649,650

AUTHOR INDEX

Author	Reference
Abell, R. G.	1
Abercrombie, M.	106,891
Abitz, W.	248,761
Abramson, H. A.	544
Ackermann, W.	433,488
Adams, R. S.	423,524,525,554
Adova, A. N.	482,483,484
Aggeew, N.	611
Alburn, H. E.	281
Alexander, J.	739,807,808
Alfejew, S.	2
Alge, A.	578
Almquist, H. J.	282
American Leather Chemists' Association	545
Ames, W. M.	740,741,742
Amprino, R.	156
Anderson, H. V.	228
Andrew, R. H.	439
Anon.	546
Arbusov, D.	873
Arbuzov, G. A.	522,547,644
Astbury, W. T.	204,205,206,207, 208,209,210,211, 212,213,214,215, 216,217,218,219, 220,221,222,892
Ash, J. E.	55
Atkin, W. R.	217,377,552,893
Attari, H.	727
Axelrod, D. J.	894,895
Babakina, V. G.	645
Bach, S.	566,760
Baehr, G.	120,121,896
Baitsell, G. A.	3
Baker, R.	953
Baldracco, F.	381,382,383,384,385
Baldwin, E.	309
Balfe, M. P.	897
Bares, J.	434
Bass, H. T.	285
Bastian, A.	354
Bate Smith, E. C. see Smith, E. C. Bate	
Baudoy, C.	112
Bauer, W.	143
Baylor, M. B.	235
Bear, A. W.	542
Bear, R. S.	223,224,225
Bechhold, H.	743
Beek, J., Jr.	305,306,307, 308,378,548
Bell, D. J.	309

Author	Reference
Day, T. D.	915,916,917,918,919
DeForge, A.	286,319,320,388,437, 438,559,560,666
DeLorem, J.	815
Demin, V. S.	667
Dempsey, M.	844,920
Derksen, J. C.	160,816
Dewsbury, W. G.	717,718,719,720,721
Dietsche, O.	452,453,454
Doehner, K.	410
Dohogne, A.	61
Dolfini, G.	109
Doljanski, L.	161,162
Dorman, A.	283
Doubrow, S.	142
Dribben, I. S.	921
Dröscher, K. Th.	772,773
Düggeli, O.	11
Duke, K. L.	922
Dulitskaya, R. A.	500,753
Duplant, F.	62
Ebeling, A. H.	6
Edsall, J. T.	750
Eggert, J.	754,755
Eichelberger, L.	287,288
Eisele, W.	288
Elder, F. R.	110
Ellison, H. L.	969
Elöd, E.	321,389
Elvehjem, C. A.	930,947
Emmett, A. D.	322
Engel, O.	456
Espin, J.	111
Esterly, A. R.	704
Ettisch, G.	163
Evans, D. E.	470
Ewald, A.	501,561
Fahrion	669
Fauré-Fremiet, E.	112,226,227,323,797, 798,799,800,801,814
Feitelberg, S.	923
Fel'dman, R. I.	429,556,562,563,616
Fenger, F.	439
Fenn, W. O.	756
Feriz, H.	113,668
Ferri, C.	265
Ferroir, J.	142
Fiessinger, N.	114
Findlay, J. D.	924
Fischer, M.	324
Fleischmann, K.	722
Fleming, J. W.	464,465

Author	Reference
Cameron, D. H.	523,524,525,554,969
Campbell, C. H.	715,716
Carreggio, L.	698
Carrel, A.	6
Casaburi, J.	651,652
Cassel, J. M.	906,907
Chambard, P.	315,343,344,345, 386,653,654,655
Champetier, G.	226,227,242
Chan, Eugene	295
Chang, P. C.	387
Chang-Tai Yen	387
Charlwood, P. A.	899
Chater, W. J.	656,657,658, 659,660,661
Cherbuliez, E.	316,317,555
Chernov, N. V.	318,556
Cheshire, A.	662
Chesley, K. G.	228
Chibnall, A. C.	359
Chlopin, N. G.	7
Clark, E. R.	1,8,9
Clark, G. L.	229,230,231,232, 233,234,235,236
Clark, J. H.	237,557
Claude, A.	269
Cobb, R. M.	499
Cockbain, E. G.	558
Cohn, E. J.	750
Colin-Russ, A.	663
Collin, R.	56,57,751
Compton, L. D.	908
Conabere, G. O.	58
Conn, H. J.	59
Consden, R.	909
Coolidge, T. B.	964
Coombs, F. A.	664
Copeland, D. E.	60
Copley, M. J.	858
Corey, R. B.	238,280
Corner, G. W.	159
Corrodini, C.	651,652
Cosslett, V. E.	910
Cotton-Feytis, E.	814
Cover, S.	285
Cowley, L. L.	911
Cresswell, A.	912,913
Cross, C. F.	665
Dakin, H. D.	752
Dalton, A. J.	987
Dann, L.	10
Darrow, M. A.	59
Davies, A.	717,718,719, 720,721
Davis, S.	914

Author	Reference
Greenwood, C. V.	665
Greifenhagen, W.	764
Grettie, D. P.	725
Grey, C. E.	926,927
Gross, J.	931,932,933,989
Grynfelt, E.	14
Gustavson, K. H.	331,394,395,396,397, 502 503,504,505,506, 507,508,509,510,511, 567,568,673,674,822, 823,934,935,936,937, 938,939,940,941,942, 943,944,945,946
Guyon, L.	63,85,87,183, 398,576,802
Häggqvist, G.	243
Haines, W. T.	298
Hájek, A.	805
Hale, C. W.	462
Hall, C. E.	244,274,275
Hall, J. L.	289,948
Halla, F.	569
Hallberg, J.	512
Halwer, M.	858
Hamalainen, C.	285
Hamilton, J. G.	895
Hamilton, T. S.	298,299
Hankes, L. V.	947
Hara, H.	290,291
Harper, F. R.	115
Harris, M.	361,364,370
Harrison, W.	824,825
Hartley, L. M.	948
Hass, G.	15,16
Hausam, W.	399
Hayashi, S.	116
Henderson, L. M.	947
Henny, G. C.	992
Herfeld, H.	360
Heringa, G. C.	17,18,65,160,167, 168,169,170,171, 245,246,247,570, 571,572,573,816
Hermans, P. H.	826
Herringa, G. C. - see Heringa, G. C.	
Herrmann, K.	248,761
Hertzler, A. E.	117
Herzog, R. O.	249,250,574,827,828
Heston, W.	987
Hett, O.	150
Heyminger, W. E. van.	474
Hier, S. W.	928
Highberger, J. H.	251,252,333,362, 363,400,401,513, 514,529,577,675, 676,700,726,949

Author	Reference
Fleming, W.	164
Florence, G.	332
Florin, O.	494
Fokina, N. see Fokina, N. S.	
Fokina, N. S.	260,390-92,440,564
Foot, N. C.	165
Forbes, J. C.	441
Foster, S. B.	430,431,628
Francois-Frank, L.	63,87
Frankel, M.	757,758
Franklin, K. J.	64
Freudenberg, Carl	723,724
Frey-Wyssling, A.	239,925
Frohlich, H. G.	530
Fullam, E. F.	269
Gaillard, P. J.	43
Gallun, A. F.	712
Galy, P.	88
Gamble, C. W.	565
Ganz, J.	538,705
Garnot, R.	386
Garrod, M.	839,844,966
Gavrilov, N. I.	325,393,442,443,670
Gaza, W. von.	12
Génin, G.	444
Gerngross, I.	240,241,248,257, 360,566,579,671, 759,760,761
Gessler, A. E.	926,927
Ghiron, V.	13
Gies, W. J.	110,188,202,314, 322,341,490
Gillette, E. P.	166
Gilligan, D. R.	284,297
Gilman, J. A.	605
Ginoza, Y. W.	869
Ginzburg, E. I.	528
Giroud, A.	242
Glücksmann, A.	10
Goetz, A. W.	706
Gonnell, H. W.	249,574,575
Gordon, A. H.	762,817,818
Gorin, M. H.	544
Gorrod, M. E.	920
Gould, B. S.	967
Graham, C. E.	928
Graham, T.	763
Grassmann, W.	326,327,328,329,330, 445,446,819,820
Green, R W.	672,929
Greenberg, D. M.	821
Greenhut, I. T.	930

Author	Reference
Katz, J. R.	240,241,256,257,258,579, 580,581,582,583,584
Kaunitz, P. E.	923
Kaverznev, E. D.	670
Kaye, M.	68,173,585
Keller, R.	337
Kelly, M. W.	432,540,541,629,630
Kendall, J. I.	956
Kenten, R. H.	901,902,903,904,905
Kenyon, J.	727
Kernot, J. C.	402
Kersten, Harold - see Kersten, H. J.	
Kersten, H. J.	251,252,726
Kirby-Smith, H. T.	9
Kirst, W.	957
Klemperer, P.	120,121,958
Klenk, L.	330
Kleppinger, C. T.	996
Knaggs, J.	402,403
Knake, E.	20
Knödel, G.	587,588
Koepff, H.	774
Koester, H.	714
Koisi, S.	259
Kolkmeijer, N. H.	245,573
König, J.	764
Kostenko, A. S.	519
Kotov, M. P.	260
Koval, V.	768
Kowalewski, J. F.	451
Krajian, A. A.	69
Kratky, O.	261,959,960
Krause, A. C.	294,295
Kreis, J.	122
Krüger, D.	769
Kruyt, H. R.	570,586
Krylova, N.	296
Kubelka, V.	587,588,589,590
Küntzel, A.	70,71,72,174,262,338, 339,340,404,405,406, 407,408,409,410,411, 412,413,414,415,416, 417,452,453,454,455, 456,520,521,591,592, 680,681,682,683,770, 771,772,773,774
Kuthy, A. von	593
Kutyanin, G. I.	522,961
Lafrancaise	493
Laguess, E.	175
Lamarque, P.	263
Lamb, M. C.	665
Lambert, R. A.	123
Lang, K.	292,293

Author	Reference
Hiller, A.	376
Hobbs, R. B.	677
Höber, R.	829
Hobson, R. P.	447
Hofmeister, F.	334,335
Holland, H. C.	516,517,518,527,692
Holleman, L. W. J.	765
Homberger, E.	118
Hooft, C.	169,170
Hoppe-Seyler, /E/, F. /I/	172
Hoppe-Seyler, G.	292,293
Horn, M. J.	950,951
Horwitt, M. K.	811
Houck, R. C.	789,790
Hough, A. T.	678,952
Howe, P.	153
Howes, E. L.	119
Huggins, M. L.	253
Humphrey, J. H.	830,831
Hunt, F. S.	499
Hunter, H. L.	854
Huzella, T.	19,254
Ishidate, M.	832
Jacoby, T. F.	373,622,623,624,625,626
Jakus, M. A.	244,255,274,275
Jalowy, B.	66
Jamet, A.	345
Jancke, W.	250,575
Janicki, J.	330,446
Jeannerat, J.	317,555
Jennison, M. W.	448
Jenzen, A.	135
Jirgensons, Br.	766,767
Johnson, M. L.	106,891
Johnston, W. W.	449
Jones, D. B.	950,951
Jones, F. L. Seymour - see Seymour-Jones, F. L.	
Jones, W. M.	953
Jong, H. G. B. de	765
Jordan-Lloyd, Dorothy - see Lloyd, D. J.	
Jovanovits, J. A.	450,578
Jullien, L.	67
Kaesberg, P.	954
Kalb, G. H.	707
Kanagy, J. R.	336,361,364,679, 906,907,955
Kaplan, V. A.	553
Karssen, A.	247
Kashina, T. S.	781
Katersky, E. M.	297

Author	Reference
Macpherson, H. T.	365
Maksimow, A. A. - see Maximow, A. A.	
Mall, F. P.	176
Mallory, F. B.	76,77,177,178
Manning, C. R.	341
Mardashev, S. R.	968
Mardles, E. W. J.	780
Markley, K. S.	847
Marquard, W.	686
Marquardt, G.	456
Marriott, R. H.	366,419,458,459,460,598,599,601,840,841
Martin, A. J. P.	762,817,818
Martin, D. E.	235
Maschmann, E.	461
Maseritz, I. H.	128
Maximow, A. A.	26,27,28,78,179
Mazoué, H.	29
Mendeloff, J.	79
Menschel, H.	613
Merrill, H. B.	463,464,465,491,492,690,691,848,849,969
Meunier, L.	315,343,344,345,424,526,602
Meyer, K. H.	264,265,316,317,555
Michallet, L.	653,654,655
Michelman, J.	730
Milhailov, A. N.	603,781
Miller, E. G., Jr.	806
Miller, J. C.	285
Minnaert, M.	572,573
Mitchell, H. H.	298,299
Modderman, R. S. T.	765
Moeller, W.	466
Mollendorff, W. von.	31
Monserrat, J. L.	80
Montagna, W.	970
Montalcini, R. Levi - see Levi-Montalcini, R.	
Moor, S.	367,971,993
Morgan, A. F.	283
Morgulis, S.	303
Morin, G.	81,82
Morrione, T. G.	972
Morse, W.	300,850
Moskova, I. S.	393
Moskova, Yu. S.	425,467,468
Mossman, H. W.	973
Moyer, L. S.	544
Mulder, G. J.	851,852
Müller, J.	853
Mullin, C. E.	854
Murphey, C. E.	285
Murphy, G. E.	974
Myers, V. C.	129,281

Author	Reference
Lang, W. W.	129
Lange, Gustav	729
Larson, C. E.	821
Latschar, C. E.	289
Lee, A. B.	73
Lengyel, J.	19
Lennox, F. G.	962,963
LePlat, G.	74,418,684
Levi, G. M.	21
Levi-Montalcini, R.	22
LeViet, L.	602
Levis, M. R.	23,24
Lewis, W. H.	24
Li, T. T.	411
Lieben, F.	833
Liesegang, R. E.	775
Lightfoot, L. H.	964
Lillie, R. D.	75,965
Lillie, R. S.	834
Lipatov, S. M.	556
Lloyd, D. J.	68,419,420,457,585,594, 595,596,597,598,599, 685,776,777,778,779, 835,836,837,838,839, 840,841,842,843,844,966
Loeb, J.	845
Loeb, L.	124
Lohr, H. A.	17,18,571
Loiseleur, J.	125,332,600,846
Lomax, R.	219
Loofbourow, J. R.	967
Lottermoser, A.	421
Lowry, O. H.	297
Loy, H. W.	289
Lucas, C. C.	356
Lucien, M.	25
Lustig, E. Sacerdote de - see Sacerdote de Lustig, E.	
Macaigne, M.	126
McCandlish, D.	552
McCarty, K.	927
McClean, D.	462
McDonald, F.	16
MacFadyen, D. A.	376
Macfarlane, R. G.	127
Machon, H.	485
Mackey, A. R.	285
McKinney, R. L.	30
Mackintosh, D. L.	289
McLaren, A. D.	914
McLaughlin, G. D.	342,422,423,523,524, 525,554,687,688,689
MacLennan, J. D.	127
McNally, J. G.	791

Author	Reference
Pirie, A.	140,979
Pischinger, A.	42
Pleass, W. B.	495,496,497,498,599, 778,779,783,784
Plimmer, R. H. A.	860
Plotinkova, N. E.	976
Pohlman, R.	268
Pojarlieff, G.	435,436
Policard, A.	88
Pollack, A. D.	120,121,896
Popa, G. T.	187
Porter, E. C.	608,609,610
Porter, K. R.	269
Porter, R. E.	687,693
Pototschnig, B.	455
Powarnin, G.	611
Prakke, F.	72
Prebus, A. F.	270
Preisentanz, W.	416
Proctor, H. R.	612,785,786
Prudent, Inez	983
Pryor, M. G. M.	981
Ptschelin, A. A.	528
Pullinger, B. D.	139,140
Pund, E. R.	898
Queido, A.	43
Queroix, M.	526
Radice, J. C.	141
Rafferty, G. T.	235
Ralston, A. W.	439
Rathery, F.	142
Rautenstrauch, W.	694
Reed, H. C.	861
Reed, R.	984,985
Rees, M. W.	369
Reitstötter, J.	755
Retzsch, C. E.	514,676
Rex, R. O.	9
Rezabek, G.	695
Reznichenko, M. S.	862
Richards, A. N.	188
Richardson, K. C.	986
Riederle, K.	328
Riesen, W. H.	947
Riess, C.	520,521
Rigaut, O.	122
Rimington, C.	863
Rinehart, J. F.	189
Robertson, M. E.	457
Robertson, W. v. B.	143,987
Rochemont, R. D. de	148,640
Roddy, W. T.	89,90,803,804

Author	Reference
Nageotte, J.	32,33,34,35,36, 63,83,84,85,86, 87,130,131,132, 133,134,180,181, 182,183,576,802, 855,856
Nauen, F.	469
Nersesova, E. N.	358
Neumann, S.	745
Nicaud, P.	126
Niedercorn, J. G.	470
Niemann, C.	746,809
Nilssen, B.	857
Noer, H. R.	973
Northrop, J. H.	471,472,473,782
Nutting, G. C.	858,975
N. V. Koninklijke Pharmaceutische Fabrieken voorheen Brocades-Stheeman & Pharmacia	728,731,732,733, 734,735,736
Oakley, C. L.	474
Oberling, C.	135
Odiette, D.	185
O'Flaherty, F.	184,513,688,803,804
Ökrös, S.	136
Olefnikova, E. I.	486
Olivo, O. M.	37,38
Onclay, J. L.	788
Orekhovich, K. D.	976
Orekhovich, V. N.	976
Ottens, E. F.	539
Page, A. W.	475
Page, R. O.	475,527,604, 605,692,977
Pankhurst, K. G. A.	606,978
Parker, E. A.	236
Parker, F.	178
Parker, R. C.	39
Partridge, S. M.	980
Pasqualino, A.	186
Patten, A. R.	368
Pauling, L.	859
Pautrier, L. M.	138
Pavlov, S. A.	426,428,607,875,876
Pavlovich, R. H.	137
Pchelin, A. A. - see Ptschelin, A. A.	
Petersen, H.	266
Pfeiffer, H. H.	41
Philips, J.	413,414,415
Philips, V.	412
Phillips, H.	380,842
Picken, L. E. R.	267,981
Picker, W.	737
Pincus, P.	982

Author	Reference
himidzu, M.	614
hore, A.	843
huravliev, D.	873
iegfried, M.	192
iegmund, W.	321
ilberstein, V.	727
imskaya, A.	442,443
irny, R. J.	930
izer, I. W.	481,967
mith, A. L.	370
mith, E. C. Bate	351,874
mith, P. I.	792
morodintsev, I. A.	428,482,483, 484,875,876
okolov, S. I.	429,563,615,616, 641,642,753,877
ockne, A. M.	548
oubiran	315
peakman, J. B.	878,879,880,881,882, 883,884,885,886
pencer, H. C.	302,303
piegel-Adolf, M.	992
piers, C. H.	494,699
sadikow, S. - see Sadikow, V. S.	
tacheyeva, E.	325
tagner, B. A.	738
takheeva-Kaverzneva, E. D.	486
tandenath, F.	193
tather, F.	485
Stearns, M. L.	194,195
Stecker, H. C.	401,700
Stefanovich, I. P.	487
Steigmann, A.	794
Stein, W. H.	311,367,371, 806,971,993
Steinhardt, R. G.	627
Stiasny, E.	488,701,702,703,793
Stockall, G.	420
Stoppoloni, G.	92
Stott, E.	881,882
Stoves, J. L.	883
Strangeways, T. S. P.	49
Straumann, R.	108
Strauss, F.	103
Street, A.	220
Stubbings, R. L.	994,995
Studnicka, F. K.	93,196
Suntzeff, V.	124
Suntzowa, W. W.	45
Svegvari, A.	163
Swann, N. M.	981
Swift, H. F.	974
Sydenstricker, V. P.	898
Synge, R. L. M.	762,817,818
Tacheci, T.	421

Author	Reference
Rogers, H. J.	864
Rogers, J. S.	426a
Rohm and Haas Co.	91
Rooy, A. de.	258
Ropes, M. W.	143
Rosenbohn, A.	107
Roulet, F.	161,162
Rousselot, A.	787
Rozynek, M.	44
Rudall, K. M.	271,984,985
Ruf, R.	190
Rumery, R. E.	997
Runjantzew, A. W.	45
Russ, A. Colin - see Colin-Russ, A.	
Rutherford, H. A.	370
Sacerdote de Lustig, E.	22,46
Sadikov, V. S.	346,347,348,349,427, 476,477,696,697,865, 866,867,868
Sakaguchi, T.	832
Salcedo, I. S.	515,529
Salle, A. J.	69
Samec, V.	589
Sandison, J. C.	47,48
Scatchard, G.	788
Schaad, J. A.	234,236
Schachowskoy, F.	530
Schachowskoy, Th.	389
Schade, H.	613
Schein, A.	812
Scherer, J.	870
Schiaparelli, C.	531,698
Schleich, H.	329,355
Schlesinger, M. J.	284
Schmiedeberg, O.	191
Schmitt, F. O.	244,272,273,274, 275,933,988,989
Schneider, F.	301,330,350,446
Schneider, J.	805
Scholl, A.	764
Schosnig, F.	144
Schröder, G. D.	871
Schultze, M.	872
Schwank, M.	417
Schweikert, E.	424
Scott, D. B.	99
Seitz, A.	174
Sekora, A.	261
Semina, L. A.	968
Senti, F. R.	858,991
Seymour-Jones, F. L.	478,479,480, 489,709
Sheppard, S. E.	789,790,791
Shestakova, I. S.	607
Shimanovich, S. B.	519

Author	Reference
Warns, E. H. J.	247
Warrack, G. H.	474
Warren, W. J.	236
Watanabe, K.	796
Weidinger, A.	171,246,580,581,582,583,584,816
Weidner, C. L.	708
Weir, C. E.	999,1000,1001
Weiss, P.	203
Werner, M. (Kiel)	147
Whewell, C. S.	886
Wilder, V. M.	303
Williams, D.	710
Williams, J. W.	788
Williams, R. G.	9
Wilson, E. O.	543
Wilson, J. A.	104,491,492,542,612,632,633,634,711,712,786
Winetzkaja, E. J.	635
Woelfflin, R.	799,800,801
Wöhlisch, E.	148,149,150,636,637,638,639,640
Wolbach, S. B. see below	
Wolf, J.	50,51,52,53,54
Wolfe, J. M.	154,921
Wolff, R.	493
Wolpers, C.	268,276,277,278,1002,1003,1004,1005
Woods, H. J.	221,222
Worschitz, F.	279
Wolbach, S. B.	151,152,153
Wright, A. W.	154
Wright, B. A.	1006
Wright, J. H.	77
Wrinch, D. M.	889
Wrixton, C. H.	969
Wyckoff, R. W. G.	238,280,990
Wyssling, A. - see Frey-Wyssling, A.	
Yang, S. H.	924
Yensen, M. M.	890
Yoder, L.	304
Yuditskaya, A. I.	1007
Yu, S. C.	543
Zaides, A. L.	641,642,1008
Zervas, L.	355
Zimmerman, R. L.	299
Zitzlsperger, S.	105
Zotov, G. V.	643
Zurhelle, E.	155

Author	Reference
Tadokoro, T.	372,887
Tandler, R.	352,569,833
Tansley, K.	10
Taussig, I.	590
Taya, S.	532
Tebb, M. C.	197
Techoueyres, E.	198,199
Tenney, B. J.	94
Terrasse, G. L.	353
Than, F.	795
Thanhoffer, L.	95
Thaureux, J.	617,618
Thayer, F. D., Jr.	470
Theis, E. R.	228,373,533,534, 535,536,537,538, 539,619,620,621 622,623,624,625, 626,627,689,704, 705,706,707,708, 994,995,996
Thiele, H.	436
Thomas, A. W.	430,431,432,489,540, 541,628,629,630,709
Thomas, B. H.	304
Thomas, J. A.	96
Tiffeneau, R.	142
Tobin, C. E.	997
Tomlinson, J.	946
Townend, F.	884,885
Tracy, G.	490
Tristram, G. R.	374
Troitzkaja-Andreeva, A. M.	97,98
Tschernow, N. W. - see Chernov, N. V.	
Tsi Tchoune Li - see Li, T. T.	
Turley, H. G.	99
Tustanovskii, A. A.	976
Ujsagby, P.	95
Unna, P. G.	100,200
Urbain, A.	125
Urtubey, L.	101,201
Vail, G. E.	289
Valle, G.	102
Vandegrift, G. W.	202
Van Heyningen, W. E.	899
Van Slyke, D. D.	375,376
Van Vlimmeren, P. J.	998
Vassos, G. A.	145
Vinetzkaya, E. Ya.	631
Vogel	888
Von Kuthy, A. - see Kuthy, A. von.	
Von Mollendorff, W. - see Mollendorff, W. von	
Von Volkmann, R.	103
Voss, K.	360
Wail, S.	146
Waitkoff, H. K.	928

Subject — Reference

teries
aging changes in.....98
collagen in.....97
teriosclerosis, collagen in.....116
thus phenomenon.....147
scorbic acid - see Acid, ascorbic
spergilus oryzae, proteases of.....486
trocytoma, pseudo-papillary.....135
can staining method.....103

cteria, proteolytic, action on
collagen and elastin.....451
ryta, action on human hair.....886
se(s) - see also Alkalis
action on
collagen.....388
gelatin solutions.....770
combination with proteins.....836
hexone, effect of nitrous acid
on.....860
organic, effect on collagen.....901
ate(s)
effect on collagen fibers.....578
fermentative.....455
value of.....450,456,491
ating.....437,438,440,455,459,
463,466,492,945
eef, quality of.....289
iochemistry of
cancer formation.....107
skin.....585
iological Stain Commission,
methods used by.....59
iology
electron microscopy in.....988
X-ray deffraction studies in.....992
lood, ox, glucosanunodimannose
from proteins of.....863
dies, collagenous, behavior
toward light.....565
dy, collagen in the.....118
nd, hydrogen.....214,634,944
one(s).....853
biochemical studies of.....290,291
collagen, combination with HCl.....378
digestion by Phormia regina
larvae.....128
glutin from.....566
proteolysis of.....982
tissue elements of.....172

Subject — Reference

Bone(s) - Continued
undecalcified, method for
cutting.....894
x-ray diffraction studies of.237,263
Bromine, effect on proteins.....833
Brownian movement of collagen
fibrils.....247

Calfskin, action of trypsin on.....464
Cancer formation, biochemistry of....107
Cancer, lung.....141
Capacity, acid-binding.....935
Carbohydrates in collagen...307-309,329,
330
Carcinoma, spherical bodies in...926,927
Carcinogens.....119
Cartilage
chondroitin sulfate in.....980
composition of.....853,970
hyaline.....156
proteolysis of.....982
Catgut.....6
Cells(s)
cancer.....123
connective tissue.....177
living, study of..1,9,47-49,194,195
mesenchyme.....7,8,24
physical chemistry of.....829
tissue culture, electron
microscopy of.....269
Cellulose.....231,546
Chambers, transparent in rabbits'
ear.....1,9,47,48,194,195
Chemistry of
catechin tannin.....310
cell surfaces.....544
collagen.....586
colloids.....808
connective tissue.....980
gelatin.....586,747,748
glue.....586
integument.....300,850
leather.....393
leather manufacture..104,689,71
tanning.....58
proteins.....828,835,843
skin.....286,3
proteins.....6
physical, of collagen.....615,870
tanning.....671,820

SUBJECT INDEX

Subject — Reference

Absorption, acid....407,416
spectra, ultra-violet....967
water, by collagen and leather....556
Acetyl-glucosamine, estimation of....830
Acid anilin dyes - see Dyes
Acid(s)
acetic, effect on hide powder....426a
action on
collagen solutions....398
hide powder....421,426a
hide substance....411
amino - see Amino acids
ascorbic (Vitamin C)....5,29,43, 46,143,152,987
combination with proteins....836
for lime removal from skin....409
formic, pickles....416
hydrochloric
combination with collagen....378
effect on collagen....403
equilibrium with collagen....643
sodium chloride pickles....407
swelling curve of collagen....400
titration curve of collagen....400
inorganic (mineral)
effect on
collagen fibers....404,405
fish skins....402
lactic, effect on hide powder....426a
lignosulfonic, reaction with
collagen....940,946
hide substance....510,511
monoamino, determination by
chromatography....374
nitrous, action on
collagen....377
hexone bases....860
organic
effect on
fish skins....402
hide powder....426a
glacial, protein solutions
in....821
pickles....407,416
rhodanilic, in determination
of l-proline....745
salts, for lime removal from
skins....409
sulfuric, hydrolysis....749
sulfuric, pickles....416

Subject — Reference

Acid(s) - Continued
tartaric, in preparation of
adhesives....686
Adhesions, peritoneal....117
Adhesives, preparation of....686
Adsorption....551,587,589,590
Albumin, egg, structure of....746
Albuminoids....807,815
Aldehydes, tanning power of....507
Alkali(s)
action on collagen..309,403,413-415, 429
effect on collagen....901,904
Amino acid(s)
basic, in
collagen....362,363,365,373,902, 903,994,995
keratins....811
proteins....365
chromatography of....374,971,993
composition of
casein....947
collagen....902,903
eukeratins....812
gelatin....752,902
gramicidin....818
isinglass....356
proteins....357
scleroproteins....928
determination....311,357,752,993
dicarboxylic, in collagen...902,903, 994,995
Amino nitrogen - see Nitrogen, amino
Amnion, electron microscopy of....973
Ammonia, origin in lime liquors....366
Amyloid, formation in the body....191
Analysis
amino acid - see Amino acid determination
tannin....662
x-ray - see X-ray analysis
Anatomy, microscopic, vertebrate....956
Aniline-blue collagen stain....75,76
Anisotropy, magnetic....814
Antibodies, formation of....859
Antiseptics in leather production....645
Aorta, thoracic, aging process in....129
Arginase, skin....968
Arginine, determination of....950

Subject — Reference

Collagen(s) - Continued
disposition in
Auerbach's plexus.....82
pansacral nerve.....81
distribution in guinea pig.....964

electrochemical properties of....643
electron microscopy of...244,272-276, 278,975,989,1002-1004
electrophoresis of.....548,906
elementary composition...314,322,334, 335,341,870
esterified, reactivity of.....905
expansivity of.....1000

fibers, see Fiber(s) collagen
fibrous, tension equilibria of.....638
fixation of water by.....562
floculation of.....600
formaldehyde tanning of...495,496,498
free amino groups of.....539

gel.....84

heat denaturation of.....568,936
heat denatured, acid-base binding capacity of.....625
heat of combustion of.....341
heat of transformation during lime treatment.....410
hide, bovine
affected by trypsin.....938
combination with HCl.....378
properties of.....347
histological reaction for.....501
hydration of.....631,635
hydrogen bonding of dehydric phenols by.....944
hydrolysis to gelatin 312,315,316, 318,322,351
hydrothermal
denaturation of.....936
stabilization of.....942

insoluble, for closing wounds.....13
intestinal wall.....234
iso-electric point of....429,906,907

methylation of.....380

Subject — Reference

Collagen(s) - Continued
preparation and purification of...305,311,321,323,332,333,340, 343,344,349,378,711, 822,903,906,907

reaction(s) with
alkali metals.....428
carbon disulfide.....427
chrome aquo salts.....512
formaldehyde.....939
lignosulfonic acid.....940,946
quinone.....526,535
tannin, sulfite cellulose extract.....522
tannin, wattle.....977
reactions for.....319
reactive groups of.....936
relation to reticulin.....154

selective staining of.....75
shrinkage of.....962,963,966
shrinkage temperature....580-584,630
shrunken, for determining bating value.....456
skin.....66,325
acid-base binding power of...622
amino acids (basic and dicarboxylic) of.....994,995
human, electron microscopy of.....933
pathology of.....138
solubility in dilute acids....34,35, 130-134,418
solubility of.....112,617
soluble, properties of.....323
steer hide, chemistry of.....400
structure of.....305,334,335,552
subcutaneous.....85,87
swelling of.....95,110,388,390,400, 403-407,416,421,469,490, 560,561,564,582-584
during liming.....379
in HCl.....419
influence of proteases on...110, 490

tampons.....113
tanned
affected by trypsin.....674
physico-mechanical properties.....547
stability of.....616

Subject — Reference

Chlor-chondrin.....871
Chloride(s)
chromic, tanning property of.505,538
in dog tendons.....287
Chondrin(s).....851,852,888
Chondroitin sulfate.....980
sulfuric acid.....191
Chordae tendinae, x-ray study of.....923
Choroid, chemical composition of.294,295
Chromatography.....374,817,909,993
Chrome
combination with collagen.....644
fixation by collagen.....937
Cirrhosis.....111,114,972
Clostridium welchii.....474,899
Clot (coagula), collagenous.....130-132
Collacin.....200
Collagen(s)
A.....134,317
absorption spectra, ultra-
violet.....967
acetylation of.....380
acid-base binding capacity
of.....623,624
acid binding power.....423
adsorption of water vapor.....929
affected by
acids.....403
aliphatic diazo compounds....957
alkali(s)....309,403,413-415,429,
904
metals.....428
sodium hydroxide.....403
ascorbic acid.....143
enzymes.....907
hydrogen peroxide.....143,1002
nitrous acid.....377,424
palatine fast dyes.....389
pancreatin.....436
potassium thiocyanate.....393
proteinases.....945
proteolytic bacteria.....451
salts.....426,607
saturated lime solutions.....401
trypsin.....443,444,446,458,460,
475,478-480,488,938
vegetable tanning.....893
amido nitrogen of.....318
amino acids in - see Amino acid
amino nitrogen of.....361,364
antigenic properties of.....125

B.....134,317

Subject — Reference

Collagen(s) - Continued
basic amino acids of....362,363,365,
373,902,903,994,995
effect of calcium hydroxide
on.....373
basic reactions of.....338
basophile.....200
boiling temperature of.....607
bonding with
sulfite cellulose extracts...961
syntans.....961
bone, combination with HCl.....378

carbohydrates of.....307-309,329,330
catalyzed.....346
chemistry of.....333-336
chromates.....500
chrome tanned.....251
clots (coagula, coagulated,
coagulum).....19,35,84,130-132
colloid chemistry of.....586
combination with
acids - see Acid(s)
alkalis (bases) - see Alkali(s)
chrome.....644,937
dyes.....381-385
iron salts.....500
phenol.....417
tannin.....527,604
combining weight of.....300
composition of.....336
constitution of.....313
corena, ox, effect of mustard
gas on.....979

deaminated.....377,387,424,431
reaction with
chrome.....503
formaldehyde.....497,537
reactivity of.....905
degeneration.....146
in dermatosis.....115
degradation.....142
denaturation.....340
denatured, salt.....626
derivatives, see Derivatives,
collagen
determination...283,284,287,292,293,
296,297,299,302-304,948
diseases.....120,121
dispersion in copper ammonium
solution.....563

Subject — Reference

Elastin - Continued
determination of.....297,304
effect of
enzymes on.....805
potassium thiocyanate on.....393
elastic properties of.....797
in beef muscle.....983
in lung.....141
rearrangement temperature of.....797
skin.....36,138
thermal transformation of.....798
titration curve of.....801
Electrolyte(s)
colloidal.....837
effect on
collagen hide fibers.....578
gelatin.....756
human skin.....288
influence on osmotic pressure
of colloids.....834
Electron microscope
in biology.....988
in dermatology.....235
Electron microscopy,244,269,270,272-278,
910,926,927,931-933,
953,973,975,984,985,
988-990,1002-1004
of amnion.....973
of collagen.....975,989,1002-1004
of human skin.....933
earthworm cuticles.....984
elastic tissue.....932
muscle.....985
sarcolemma.....953
sodium hyaluronate.....931
teeth.....990
tissue sections.....926,927
Electrophoresis of
collagen.....548
modified collagen.....906
Element(s)
histological, staining method
for.....67
tissue.....172
elastic.....277
Embryo(s), fowl.....21,23
Endometrium, collagen, network of....122
Endothelium, capillary.....159,189
Eukeratins
amino acid composition of.....812
Enzyme(s)
blow-fly larva (lucilia
Serecatio).....447

Subject — Reference

Enzyme(s) - Continued
cod.....449
effect on elastin.....805
general.....433-492
haddock.....449
in edema formation.....110
pancreatic.....492
proteolytic.....445,455,457
from mushrooms.....434
reactions with collagen.....347
Epidermis, mammalian, fibrous
proteins of.....160
Equilibria, tension of fibrous
collagen and rubber.....638
Erythema, radium.....155
Estrogen, effect on mouse vagina
cervex and stroma of uterus.....124
Explants, osteogenetic.....43
Extract(s)
sulfite cellulose.....961
testicular.....462

Fabric(s).....216
protein.....889
Factors, diffusing.....462,830,831
Fat, of dog tendons.....287
Feather rachis, x-ray study of.....225
Fever, rheumatic.....974
Fiber(s).....216,220,221
animal
mechanochemical method
for use with.....880
sulfur linkage in.....878,879,
883,886
argyrophillic.....26-28
demonstration in
connective tissue.....105
biological, structure of.....892
collagen.....144,213,266,279,
557,569,1008
acid contraction of.....150
alkali swelling of.....390
arrangement in veins.....64
artificial.....649,650
behavior in cultures.....21
characteristics in vitro
culture.....22
cornea.....56
deaminated.....387
development of.....22,26-28
differentiation in vitro.....37

Subject Reference

Collagen(s) - Continued
tanning with vegetable tannins
in aqueous organic solvents..969
tendon
activation of.....1001
catalytic decomposition of...348
combination with HCl.....378
properties of.....347,1001
thermic transformation of.....617
thermodynamics of.....636,637,640
thermolability.....630
titration curve.....903
treatment with
alkali 429
natural salts.....567
tyrosine content of.....360
tryptic digestion of.....435,489
two (II).....316

ultra-violet absorption spectra..967
uptake of water by.....901

vegetable tanned.....251,262

water diffusion into.....603
wet, effect of temperature on....999

x-ray study of.....204-226,272

Collagenase, from Clostridium
welchii.....474,899
Colloid(s).....230
lyophillic.....765
osmotic pressure of.....834
radioactive rays effect on.....846
tissue.....12
Colloidal behavior, theory of.....845
Compound(s)
aliphatic diazo, action on
collagen and keratin.....957
chrome-collagen.....673
chromium.....504
collagen-tannin.....691
colloidal.....665
organic
halogen.....583
sulfur.....582
Concept, micellar.....231,239
Conjunctiva, chemical composition
of.....295
Connective tissue, see Tissue,
connective

Subject Reference

Corium, histology of.....65
Cornea,
capillary formation in.....898
collagen fibers of.....56
Crystallization, reversible, in
tendons.....557
Curves, titration
collagen.....903
in HCl and NaOH.....400
feather keratin.....884
protein fibers.....838
wool keratin.....881
Cuticle, earthworm, electron
microscopy of.....984

Darmstadt, work in progress at.....702
Depilation.....694
chemical.....683
Derivatives, collagen
aging of.....553
physical chemistry of.....615
Dermatology.....235
Dermatosis, chronic.....115
Differences, sex, from standpoint
of biochemistry.....887
Diffusing factors.....830
Diketopiperazines of leather.....670
Dioxopiperazines, skin collagen.....325
Dye(s)
acid-analine.....75
combination with collagen....381-385
fat soluble.....83
palatine fast, action on
collagen.....389

Ear, rabbit, transparent chamber
in.....1,9,47,48,194,195
Earthworm cuticle.....984
Edema.....110,613
Elacin.....200
Elastic tissue - see Tissue, elastic
Elasticity, rubberoid.....639
Elastin.....184,188,200,490
absorption of water.....800
action of proteolytic bacteria
on.....451
adsorption of water vapor by.....929
composition of.....806
see also Amino acid(s)

Subject — Reference

ormaldehyde - Continued
combination with
collagen.....495,496,498,939,942
keratin.....495-498
silk fibroin.....495
determination.....676,681

alactose.....309
angrene, gas, toxemia.....127
s, mustard
action on ox cornea collagen.....979
distribution in tissues.....895
elatin.....256,257,317,322,351,
570,579,612,739-796
absorption of water by.....776-779,
783,784
acetylation of.....380
affected by
alkali.....429
electrolytes.....756
formaldehyde.....760
heat.....775
neutral salts.....793
pancreatin.....436
amino acids in.....311,752,902
chemistry and determination of...747
coagulated.....751
colloid chemistry of.....586
cowhide, partial acid
hydrolysis of.....762
degradation products of.....767
demineralization of.....787
elementary composition of.....341
equilibrium with dilute HCl..785,786
estimation of.....303,764
from collagen.....312,774
hydration of.....631,635
hydrolysis of.....782
incipient shrinkage of.....606,978
iso-electric point of.....429,760
methylation of.....380
molecular structure of.....217
molecular weight of.....755,767
origin of.....794
particle shape of.....767
peptization by mixed liquids.....780
precipitability of.....766
preparation of.....740-742
production of.....768
proline content of.....354,355

Subject — Reference

Gelatin - Continued
sperm whale.....796
strongly stretched
preparations of.....240
structure of.....745,756
swelling.....744,770
tanned, stability of.....616
thermodynamics of.....637
tyrosine content of.....360
Gels
gelatin.....753,755,789,790
mutarotation of.....771
high molecular.....877
Gland(s)
adrenal, female rats,
connective tissue of.....921
mammary, contractile
tissues in.....986
Globulins, muscle.....483,484
Glucosamino dimannose.....863
Glue - see Gelatin and
glue (739-796).....257,739,743,
759,792
chemistry of.....748
collagen and.....781
colloid chemistry of.....586
Glutin from bone and skin.....566
Glutokyrin.....328
Glycine
determination of.....367,368
discovery of.....749
Glycogen of human cartilage.....970
Glyoxal, action on hide protein.....934
Goat.....986
Gorgonin.....810
Grain, histology of.....65
Grafts, tendon.....33
Gramacidin, amino acid
composition of.....818
Groups
amino aliphatic, determination
of.....375
guanidyl.....942
reactive, collagen.....936
Guinea pig, collagen
distribution in.....964
Gut, surgical enzyme digestion
of.....481

Subject	Reference
Fiber(s) - Continued	
double refraction of	262
effect of	
lime-sodium sulfide mixture on	391
liming on	392
elastic properties of	265
fine structure of	71,7[illegible]
for precipitation of lime	10[illegible]
formation in cultures of connective tissue	20,27
formaldehyde tanned	941
genesis of	18,38
hide	578
in arteriosclerosis	116
mechanically deformed	252
metamorphosis of	25
method for demonstration in connective tissue	105
frozen sections	69
molecular structure of	213,218 265,272,279
morphology of	72
muscle, acid contraction of	150
non-tendon	57
optical properties of	699
origin of	18,38,50,51
pretanned	260
production of	
from fibrillar sols	54
in vitro	16
properties of	594
thermoelastic	150
sclerotic	56
strength of	908
structural stability of	949
structure of	591,592,641
swelling of	147,387,404-407, 450,593,601
tanned	64,252,680,941
tendon	57
collagenic - see Fiber(s) collagen	
collagenous, development of	2
from reticulum	30
in tissue cultures	26-28,30
nature and origin of	18
in great omentum of rodents	101
mechanical significance of	156
connective tissue	
action of ascorbic acid on formation of	29
development in tissue cultures	23
Fiber(s) - Continued	
elastic	265,266
high-molecular	877
keratin	22,271,824,825
muscle, thermoelastic properties of	150
organic	257
protein	204,205,208,224, 225,253,819
molecular configuration in	858
structure of	966,991
swelling of, in organic solvents	598,599,601, 841,844
tensile properties of	858
titration curves of	838
reticular	
development in vitro	22
histogenesis, in mammals	2
reticulum, method for demonstration in frozen sections	69
skin	
animal	839
argyrophillic of	66
tissue culture	30
Fibril(s)	
collagen	
affected by formaldehyde	501
anatomic	86
artificial	86
cultures in vitro	38
polarizing microscope measurements of	41
formation in Jensen sarcoma in vitro	44
molecular structure of	597
structure and growth of	35
collagenic, of connective tissue	163
collagenous, origin, structure, arrangement	17
connective tissue	161,247,561
reticular	159,189
Fibrin	110,258,490,746,809
Fibroblast(s)	6,39,40
Fibroin	380,495,623,769
Fibrosis, myocardial	284
Filtrates, bacterial culture	462
Foods, amino acid composition of	357
Formaldehyde	
action on gelatin	760

Subject — Reference

ather(s) - Continued
vegetable tanned - continued
aged, soluble decomposition products of....679
wattle-bark tanned, water solubles of....692
wet, effect of heat....565,647,652, 661,999
x-ray examination of....685
sions
cardiac, rabbit....974
connective tissue....122
ucine, determination of....367,951
wisite, distribution in tissues....895
ght, polarized, action on
tissue (connective--muscular)....136
ultra-violet, action on hide proteins....628
me....454,496,774
removal from animal skin....409
saturated solution, action on collagen....401
sodium sulfide mixtures....391
ming....466
nkage
- CH = N -....883
sulfur, reactivity of....878,879, 883,886
pids in human cartilage....970
quor(s)
lime, ammonia in....366
tan,
plumping in....605
plumping power of....693
ver, chemical composition of....293
cilia sericata (blow-fly)....447
pus erythematosus, disseminated...120, 121,896
nphatics, relation to mesenchyme cells....8
nph nodes, adult rabbit....30
otrope series and theory of tanning....549-551,580-584
otropic substances and shrinkage of collagen....580-584
sine content of meats....930

cromolecule(s)....231,238
crophage....6

Subject — Reference

Material(s)
bating....491
biological, structural units of..231
collagenous, decomposition of....324
living....232,233
natural, large interplaner spacings in....236
tanning, vegetable....494
Meat(s)
cooked, collagen determination in....283
determination of collagen in....296, 299
gelatin content of....795
lysine, methionine, and threonine content of....930
Mechanism for basic chrome sulfate reaction....554
Medicine, x-ray diffraction studies in....992
Membrane(s)
collagen....113
natural, fibril orientation in...981
Mercuric chloride, germicidal efficiency of....869
Mesenchyme
cells....8
mitosis in....24
human....7
vertebrate, fresh....196
Methionine....898,930
Method(s)
histological, see Histological technique
Loehlein-Volhard, for enzyme activity....470
Microbiological
amino acid determination by....950,951
enzyme activity determination by....470,491
photometric ninhydrin in amino acid chromatography....971
plumping....861
solubility product, for amino acid determination....367
staining, for
collagenous tissue....997
fibers, collagen, elastin and muscle....103
histological elements....67
tannin analysis....662

Subject — Reference

Haematoxylin-dioxane-phosphomolyclic acid (stain for collagen and reticulin).....96
Hair.....623
amino acid composition of.....812
animal, x-ray analysis of...204,220, 221
hydrolysis of.....848,849
Healing, wound - see Wound healing
Heart
dog, collagen, creatine, and phosphorus content of.....281
normal and pathological, collagen content of.....284
Hemaglobin, cattle.....746
Hide powder - see Powder, hide
Hide(s) - see Skins
Hide substance - see Substance, hide
Histogenesis (origin, development-in vivo) 2,3,14,17,18,32,42,50-52
Histological technique...55,59,60,62,67, 69,73-77,79,80,96,100,103-105,684
Histology.....56-58,61,63-66,68, 70-72,78,81,82,85,87, 88-92,94,97-102,104
Hyaluronic acid.....830
Hyaluronidase.....830
Hydrogen peroxide, action on collagen and thymonucleohistone..143

Industry, leather, biological problems of the.....920
Infections, skin, rabbit by goup A streptococci.....974
Inflammation
allergic, collagen degradation in.....142
chronic, due to implanted collagen.....139,140
hyperergic (Arthus phenomenon)...147
Integument, chemistry of.....300,850
Iris
chemical composition of.....295
collagen and mucoid of.....294
Iron, fixation of hide substance by..541
Isinglass, amino acid composition of.....356

Jensen sarcoma.....44

Subject — Reference

Kertin(s).....242,271,816
action of aliphatic diazo compounds on.....957
amino acid composition of.....810
basic amino acids of.....811
combination with formaldehyde...495-498
cornification of.....816
feather, titration curve of.....884
secreted.....227
structure of.....857
wool, titration curve of.....881
K-toxin.....474,899

Lamb, tenderness of.....285
Leather(s) - see 645-712.....256,664
affected by trypsin.....709
adsorption of water vapor by.....955
chemistry of.....104,689,701,711
chrome
moisture content of.....672
thermal stability of.....673
chrome tanned.....682,803
absorption of water by.....556
fixing of water by.....562
combined tanning matter of.....663
diketopiperazines of.....670
dispersion in copper ammonium solution.....563
expansivity of.....1000
fixation of tannin by.....678
formaldehyde tanned.....676
shrinkage temperature of.....704
fundamental structure of.....58
hydrolysis of.....644
hydrolytic action of acids on....411
manufacture.....820
biochemical problems in.....696
chemistry of.....104,689,711
method for testing.....669
microscopic examination of.....646
nitrogen determination of.....710
physical properties of, bibliography.....699
shrinkage temperature of.545,611,647, 648,651,652,656, 661,669,677
sole, stability of.....651,652
soluble matter of.....690,691
vegetable tanned.....656-661
action of water on.....690,691

Subject — Reference

rocess(es)
dyeing.....558
liming.....900
setting.....883
tanning.....675
chemistry of.....675
physico-chemical aspects of...558
theory of.....595,596,611
vegetable.....552,897
rocollagen.....976
roline
determination of.....354,371,745
in gelatin.....354
roperties
physico-mechanical of cellulose, collagen, and rubber.....546
tensile, of protein fibers.....858
rotease(s)
Aspergilus oryzae.....486
bacterial.....461
influence on swelling of collagen and fibrin.....110
rotein(s).....210,212,215,219,750
absorption of water vapor by.....813
action of
bromine on.....833
neutral salts on.....875,876
pepsin and trypsin.....890
amino acid composition of.....357
animal skin...619,621-623,627,994,995
as colloidal electrolytes.....837
chemistry of.....828,835,843
coagulable,
histological study of.....89,90
combination with acids and bases.....623,836
corium.....508
denaturation of.....219
determination of glycine in.....368
egg shell.....282
electrophoresis of.....544
estimation of serine and threonine in.....369
fibrous, of mammaliar epidermis...160
formaldehyde compounds.....509
heat denatured, reactivity of....823
hide,
action of
glyoxal on.....934
salt on.....399
ultra-violet light on....628
effect of vegetable tannage on.....935

Subject — Reference

Protein(s) - Continued
hide - continued
reaction with tetra-oxalato-diol-chromiate.....397
reactivity in its iso-electric zone.....331
hydration of.....219,842
hydroxy amino acids in.....358
hydroxylysine in.....376
monamino acids of.....374
industrial.....847
insoluble, amino nitrogen of.....370
muscle,
determination of.....874
peptic digestion of.....482
natural, detection with pH indicator.....832
reactivity of.....822,823
serum,
carbohydrate complex of.....863
skin.....301,373
glucide content of.....330
sorption of water vapor by.....914
structural, swelling of.....419,420
structure.....359,842,862
theory of colloidal behavior.....845
x-ray analysis.....959
see - X-ray analysis
Proteinases, evaluation of.....945
Proteolysis
measuring peptization in.....487
of bone and cartilage.....982
Protoplasm, submicroscopic morphology of.....925
Pyloric ceca, cod and haddock, enzymes from.....449

Quill, porcupine
basic amino acid content of.....811
x-ray analysis of.....225
Quinone, reactions with collagen.....526

Rabbit(s).....303,891
ear, transparent chambers in....1,9, 47,48,194,195
lymph node.....30
nerves, sciatic,
collagen content of.....106
collagen formation in.....891

Subject — Reference

Method(s) - Continued
technical, of the
Army Institute of Pathology...55
Micelle(s).....231,239
gelatin.....248,761
Microscope, polarizing.....41
Microscopy, electron - see Electron microscopy
Micro-tannology.....688
Mixtures, buffer.....452,453
Molecule, keratin, structure of..882,885
Morphology, submicroscopic.....925
Mucoid, of elastic tissue.....188
Muscle(s)
beef
collagen content of.....983
connective tissue content of.298
elastin content of.....983
clam.....225
connective tissues of.....186
dystrophic, collagen content of.....303
electron microscopy of.....985
striate.....25
Mushrooms, proteolytic enzymes from..434
Mustard gas - see Gas, mustard
Myoepithelium.....986

Nerve(s)
intercostal, fibro hyaline deposits in.....88
pansacral, collagen disposition and glandular structure of....81
sciatic, rabbit.....106,891
Ninhydrin.....971
Nitrogen
amino.....370
of collagen and wool.....361,364
collagen, of dog tendon.....287
content of
skin, human.....288
tendon, dog.....287

Operation(s)
pretanning.....455
soaking.....695
Ovary, rabbit, connective tissue of..922

Subject — Reference

Pancreatin.....436
action on collagen and gelatin..467, 468
Papain, papayotin.....433
Pathology.....106-111,113-117,119,122, 123,126,127,135-142,144-147
Pattern(s)
regeneration.....119
x-ray diffraction of bone, tendons, and connective tissue.....237
Pepsin.....441,471,472,483,484
action on proteins.....890
denatured.....473
iso-electric precipitation of.....439
Peptide(s).....750
Permeability, tissue.....462
Phagocytosis.....145
Phenol, combination with collagen....417
Phenolformaldehyde, tanning properties of.....952
Phenolnovolac, combination with collagen.....417
Phenols, dihydric.....944
Phormia regina larvae.....128
Physical chemistry of cells and tissues.....829
Physiology.....112,118,120,121,124,125, 128-134,143,148-155
Pickle(s)
action on collagen.....407,412,416
Pickling.....706
Placenta
collagen of.....94
induced.....154
Plexus, Auerbach's.....82
Plumping of calfskin.....712
Polymers, low-angle scattering in....960
Potassium thiocyanate, effect on collagen and elastin.....393
Pouch(es), pharyngeal.....42
Powder, hide
action of
acids on.....421,426a
papain and papayotin on.....433
chrome tanned, hydrolysis of.....644
formaldehyde tanned.....504
preparation of.....343,345
swelling of.....587-590,608-610
Pressure
of colloids.....834
osmotic.....754,757,758

Subject Reference

Skin(s) - Continued
animal - continued
coagulable proteins of.....89,90
fibers of.....839
histology of.....70
microbiology of.....451
removal of lime from.....409
reticular tissue of.....804
arginase in.....968
bated histology of.....91
biochemical studies of.....291
biochemistry of.....585
calf.....228
elastic tissue of.....803
minimum plumping of.....712
chemistry of.....286,310
coagulable proteins of.....89,90
collagen derivatives of.....553
collagen.....66
cow, capillary distribution in...924
elastin of.....66,138
fish, histology of.....402
fundamental structure of.....58
glutin of.....566
histochemistry of.....99,100
histology of.....70
human.....288
hydrolysis of.....848,849
oil tannage of.....653-655
reticulin of.....174
reticulum.....66
specific gravity of.....873
steer.....99
study of.....61
structure of.....58
swelling of.....386
chemical basis for.....585
unlimed, action of trypsin on....465
Soda, caustic, action on human hair..886
Sodium
fluosilicate.....645
hydroxide, titration curve of
collagen.....400
periodate, acidified, in
reticulum staining.....965
Solids, macromolecular.....238
Sols, gelatin.....789-791
Solubles, water, leather.....663
Solubility of collagen in dilute
acids.....133
Solution(s)
acid, hide powder swelling
in.....426a,587

Subject Reference

Solution(s) - Continued
alkaline, effect on hide
substance 412-415
collagen.....912
ethyl acetate, wattle-tannin in..977
gelatin.....754
size distribution in.....788
viscosity of.....789
protein, electrochemical
properties of.....821
tannin, effect on collagen
fibers.....578
Solvent(s)
aqueous organic, tanning in.....969
organic, protein fiber
swelling in.....844
Specific gravity of skin and
vegetable tannin.....873
Spectrometer, double crystal.....954
Spines, Echidna, amino acids of.....811
Spongin, amino acids of.....810
Stability, hydrothermal.....508,520
Stain
collagen, aniline blue.....75,76,96
combined elastics trichrome
for tissues.....79
selective, for collagen and
reticular structures.....75,96
Strands, collagen.....913
Streptococci, group A.....974
Structure(s)
connective tissue.....162
fibrillar, differentiation and
origin of.....45
protein.....206,207,209,211,769,809
Substance(s)
amorphous, in connective tissue..182
cellular.....201
cementing.....916,917
collagenous.....126
elastic, in tissue cultures.....185
fibrillar.....177
ground.....203
see Substance, cementing
intercellular.....158
hide.....353
action of acids on.....411
antagonistic action of
neutral salts on.....394
effect of neutral salts.....430
fixation of chromium salts
by.....506
iron salts by.....541

Subject — Reference

Rabbit(s) - Continued
ovary.....922
Radio-autography.....894,895
Rat(s)
female, adrenal glands of.....921
methionine deficient.....898
Reaction(s)
chemical, of tannage.....320
histological for collagen.....501
see also Histological technique
paradoxic pallor.....155
Reagent, Schiff, for staining
reticulum.....965
Reflections, Bragg.....954
Refraction, double, in myelini.....855
Reinnervation of rabbit sciatic
nerves.....891
Reticulin.....168,169,171,174,192,
197,246,802,1007
Reticulum.....30,178,189
collagen, in cirrhosis.....114
controlled formation of.....151
lung.....141
precollagen, in bilharzial
cirrhosis.....111
relation to collagen.....154
skin.....66
staining of.....965
Rheumatism, fibrillar.....144
Rings, Prenant's.....95
Rodents, great omentum of.....101
Rubber.....229
physico-mechanical properties of.546
tension equilibria of.....638

Salt(s)
acid.....409
action on
collagen.....426
gelatin solutions.....770
hide protein.....399
chromic.....508,519
chromium
action on gelatin.....771-773
aquo, reactions with
collagen.....512
copper, reaction with gelatin and
gelatin hydrolysates.....773
fixation by hide substance.....506
inorganic, influence on collagen.582

Subject — Reference

Salt(s) - Continued
iron.....500,519
neutral.....452,453
action on
collagen solutions..130,398,
488,567
hide substance.....412-415
proteins.....875,876
antagonistic action of.....394
effect on
boiling temperature of
collagen.....607
hide substance.....430,432
influence on
gelatin.....793
hydration of intersticial
connective tissue....918
organic acid, in chrome
tanning.....517,518
Sarcolemna, electron microscopy
of.....953,1005
Sarcoma, Jensen.....44
Sausage, collagen in.....296
Scars, alveolar cell.....126
Scattering, low angle in polymers....960
Scleroderma, diffuse.....121,896
Scleroproteins.....807,827,850
amino acid content of.....928
Sclerosis, alveolar.....126
Sclerotica, collagen fibers of.....56
Scorbutus, experimental.....151,153
Section(s)
gross anatomical.....997
tissue, electron microscopy
of.....926,927
Selenium.....710
Serine
estimation in proteins.....369
Set,
permanent of animal
fibers.....878,879,883
Sheepskin, semi-tanned.....648
Shell
biochemical studies of.....291
egg, proteins of.....282
Shrinkage, incipient.....978
Silk fibroin
acetylation of.....623,854
methylation of.....380
Skin(s).....173,820
animal
chemical depilation of.....683

Subject — Reference

Substance(s) - Continued
hide - continued
losses during soaking.....695
reaction with
ligno sulfonic acid..510,511
basic aluminum sulfate...543
basic chrome sulfate.....554
high molecular.....877
intercellular.....151-153,198
interstitial.....170,201
organic
magnetic anistropy of.....814
hydrophyllic groups of...581,584
radioactive, action on colloids..846
Sulfato-hydroxy-chromi, collagen compound.....395
Sulfides, effect on alkaline hydrolysis of hair and skin.....849
Suppurations, subcutaneous.....14
Surfaces, cell, chemistry of.....544
Suspensions, histological, behavior in supersonic field.....268
Sutures, collagen, enzyme digestion of.....481
Syncyticem, connective tissue.....176
Syntans, bonding with collagen.....961
System(s)
biological, fine structure of....267
collagen,
diseases of.....958
HCl equilibrium in.....643
lattice fiber.....254
protein, donnan equilibria and molecular effects in.....396
reticular.....92

Tampons, collagen.....113
Tannage
aldehyde.....704
basic chrome sulfate.....523-525
chrome.....996
formaldehyde.....996
iron.....519
vegetable.....998
chromium acetate.....705
formaldehyde chrome.....996
mineral.....771-773
oil.....653-655
quinone.....700
vegetable.....935
zirconium.....530

Subject — Reference

Tannin(s)
catechin.....310
determination of.....697
lignosulfonate.....522
synthetic.....417
vegetable in aqueous organic solvents.....969
specific gravity of.....873
wattle, in ethyl acetate solutions.....977
wattle-bark, combination with collagen.....527,604
Tanning
chemical and physiological aspects of.....666
chemistry of.....596
chrome.....499,500,502-505, 517,518,520,521,532,533, 538,540,595,596,705,707,708
combined, chemical processes of..698
electronic theory of.....633,634
formaldehyde.....495-498,501, 513-516,529, 534,536,537,539
mechanism of.....949
mineral.....682
theory of.....549-551,633,634,703
vegetable....535,542,595,596,632,893
zirconium.....530
Tantalum oxide in wound healing.....911
Technique
pathological.....77
tanning.....671
Teeth
electron microscopy of.....990
tissue elements of.....172
Temperature, shrinkage..545,552,561,620, 621,962,963,966
of formaldehyde tanned leather...704
significance of
practical.....619,621
theoretical.....627
Tenablasts.....21
Tendon(s).....237,241,243,571
Achilles, chemical constituents of.....314
collagen fibers of.....57
dog.....287
formaldehyde tanned.....241
fowl embryo.....21
graphs of.....33
heat contraction of.....241
reversible crystallization in....557

Subject — Reference

Tendon(s) - Continued
tail, kangaroo.....261
Tetra-oxalato-diol-chromiate, reaction with hide protein.....397
Theory, Fischer, M. H. for acid formation in edema.....613
Thermodynamics.....636,637,639
Thiocyanates
influence on shrinkage of collagen.....582
potassium, effect on collagen and elastin.....393
Thioglutin.....866,867
Threonine
content of meats.....930
estimation in proteins.....369
Thrombus collagen formation in.....109
Thymonucleohistone, affected by ascorbic acid and hydrogen peroxide.....143
Tissue(s)
animal, properties of.....149
cicatricial.....14
collagen
effect of liming on.....425
chrome tanned, influence of fat-liquoring on properties of.....528
thermodynamics of acid and alkali contraction of....636
collagenic, connective in wounds.136
collagenous, method for staining.....75,997
colloids.....12
combined elastics-trichrome stain for.....79
connective.....11,14,20,23,27,29,31, 32,46,105,122,136,144,146, 148,154,157,158,161,162-167, 169,171,175-177,179-183,186, 187,190,193-196,198,199,202, 921,922
chemical and electrical properties of.....337
chemistry of.....980
cultures of.....11,27,31
development of.....176,193-195
elastic and thermodynamic properties of.....148,149
fiber development in..23,161,162
growth in vitro.....46
human, swelling measurements on.....613

Subject — Reference

Tissue(s) - Continued
connective - continued
inflammatory, regeneration in.....179
interference and Brownian movement in.....247
interstitial.....915-919
lesions of endometrium.....122
liver.....293
loose, intercellular ground substance of.....158
pathology of collagen degeneration of.....146
physiology of.....164,166
reprecipitated, x-ray diffraction pattern of...280
reticular.....165
spread of fluids in.....919
subcutaneous.....182,183,190
syncytium.....176
thermodynamic considerations.....148,149
water binding in.....171
regeneration.....179
x-ray diffraction patterns of.....237
yellow fibrous.....201
contractile, of mammary gland....986
contractility.....264
culture(s).....4,7,11,15,16,19-24, 26-28,30,31,36-41, 43-46,49,52-54,185
dorsal chord.....93
elastic, electron microscopy of..932
embedded, surface staining of.....60
eye, distribution of Lewisite in.....895
fibrous
development in peritoneal adhesions.....117
origin and structure in wound healing.....3
swelling of, histological and physico-chemical investigation.....68
fine structure of.....264,266
firmness of.....264
granulation, tissue cultures in...15
human.....259
injured, vitamin C and repair of...5
living, method of studying.....1,9, 47,48,194,195
mesenchymal.....45